ADVANCED AND EVER ADVANCING MITSUBISHI ELECTRIC

MITSUBISHI ELECTRIC

FLOOR AND CEILING TYPE AIR CONDITIONERS

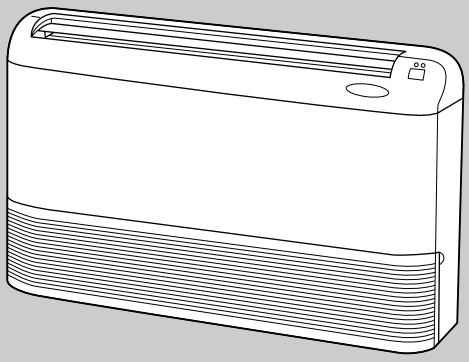
Note:
●Refer to OB196 REVISED EDITION-A for the details of MCFH-24NV-[EA] and MUCFH-24NV-[EA].

No. OB266

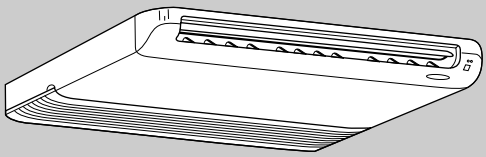
SERVICE MANUAL

Wireless type
Models
MCFH-24NV-[EB](WH) · MUCFH-24NV-[EB]

(When installed on the floor)



(When installed on the ceiling)



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1 TECHNICAL CHANGES

MCFH-24NV -EA→MCFH-24NV -EB

1. Only model name has changed.

MUCFH-24NV -EA→MUCFH-24NV -EB

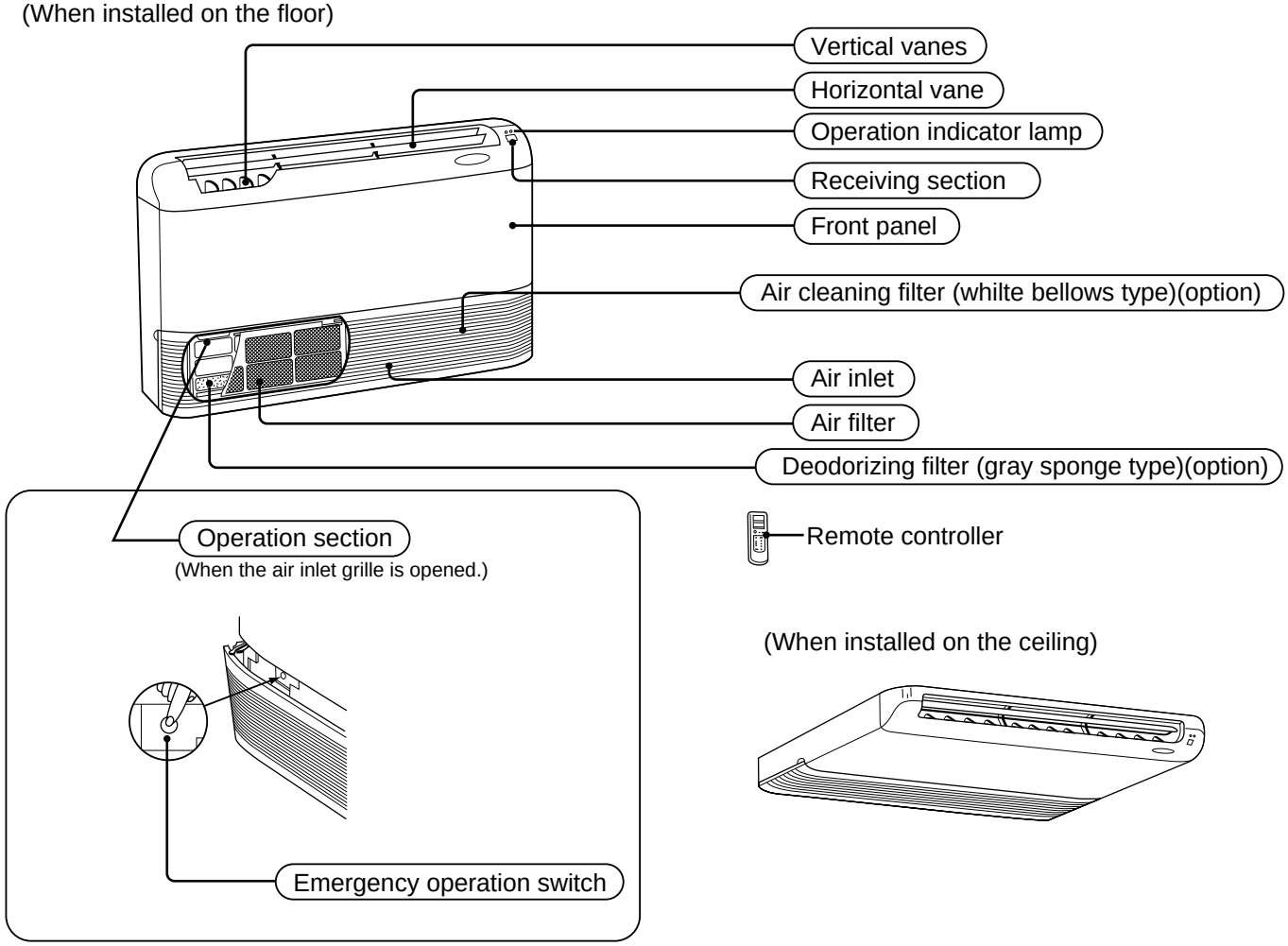
1. Ball valve has changed to stop valve.
2. Deicer P.C. board has changed.

2 PART NAMES AND FUNCTIONS

MCFH-24NV -EB

INDOOR UNIT

(When installed on the floor)



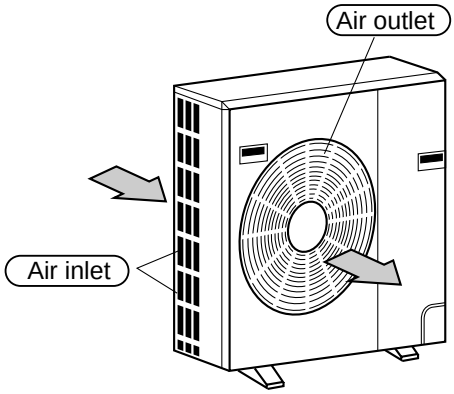
(When installed on the ceiling)

ACCESSORIES

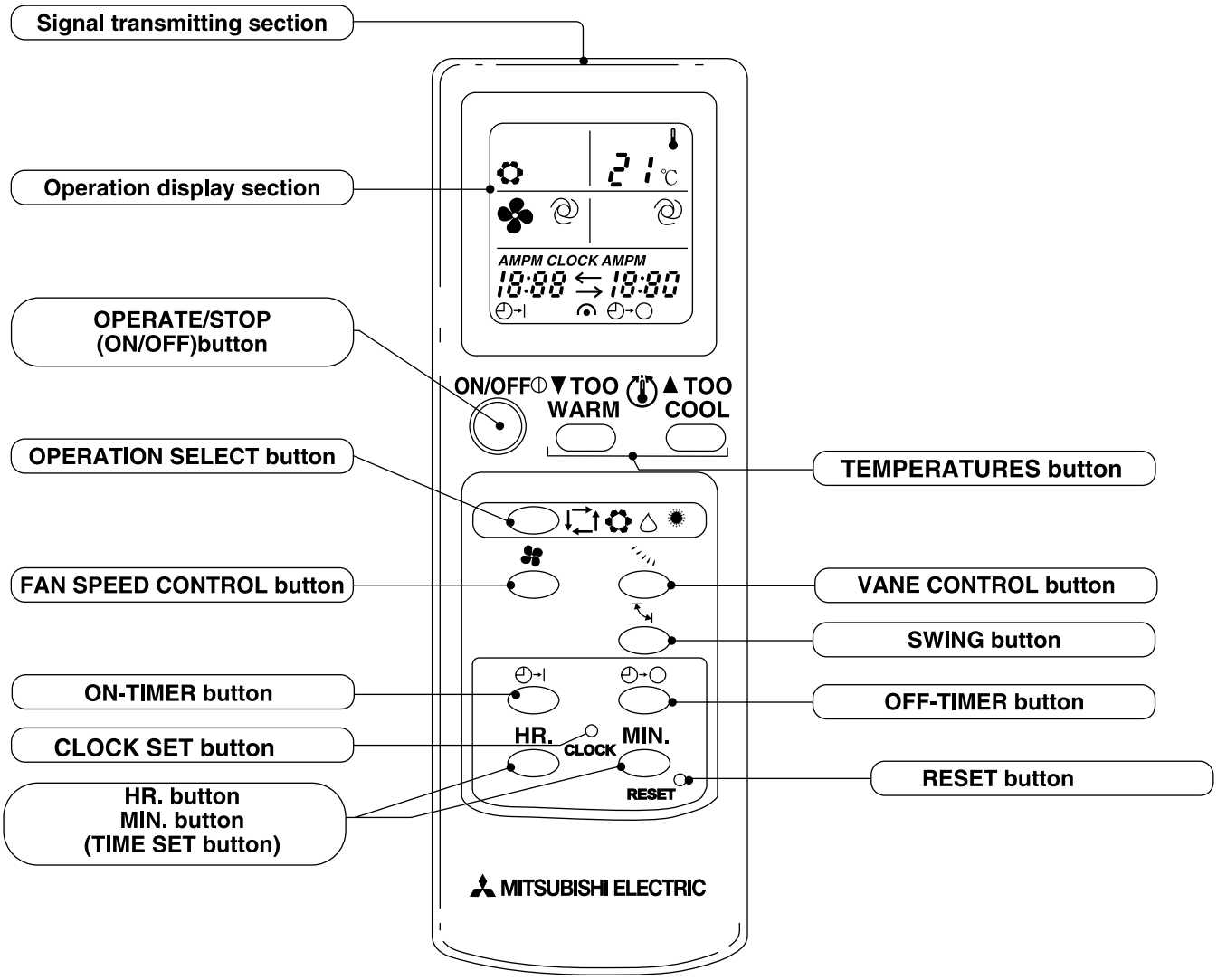
	Item	Q'ty
①	Installation plate	2
②	Unit fixing screw 5 × 12mm	2
③	Wireless remote controller	1
④	Remote controller mounting hardware	1
⑤	Fixing screw for ④ 3.5 × 16mm (Black)	2
⑥	Battery (AAA) for remote controller	2
⑦	Drain hose	1
⑧	Drain pipe cover	1
⑨	Knockout cover	1
⑩	Screw for ⑨ 4 × 10mm	2

MUCFH-24NV - EB

OUTDOOR UNIT



MCFH-24NV - EB



3 SPECIFICATION

Indoor model			**MCFH-24NV-** EB	
Function			Cooling	Heating
Power supply			Single phase 220 - 240 V, 50Hz	
Capacity	Capacity	kW	6.0	6.2
	Air flow(High)	m³ /h	840	
	Dehumidification	L/h	3.1	–
Electrical data	Power outlet	A	25	
	Running current	A	12.5-11.7	11.7-11.3
	Power input	W	2,720-2,750	2,540-2,650
	Auxiliary heater	A(kW)	–	–
	Power factor	%	99-98	98-98
	Starting current	A	59	
	Fan motor current	A	0.36	
Coefficient of performance(C.O.P)			2.21-2.18	2.44-2.34
Fan motor	Model		RB4V36-AB	
	Winding resistance(at20℃)	Ω	WHT-BLK 82.9 BLK-YLW 65.6 YLW-BLU 36.0 BLU- BRN 27.0 BRN-RED 13.7	
	Dimensions W×H×D	mm	1,100 X 650 X 180	
	Weight	kg	26	
Special remarks	Air direction		5	
	Sound level (High)	dB	48-48	
	Fan speed (High)	rpm	1,310-1,330	
	Fan speed regulator		3	
	Thermistor RT11(at25℃)	kΩ	10	
	Thermistor RT12(at25℃)	kΩ	10	
Outdoor model			**MUCFH-24NV-** EB	
Capacity	Air flow (High)	m³ /h	2,640-2,760	
Electrical data	Compressor motor current	A	11.56-10.76	10.76-10.36
	Fan motor current	A	0.58	0.58
Compressor	Model		NH-47VMDT	
	Output	W	2,200	
	Winding resistance(at20℃)	Ω	C-R 0.96 C-S 2.07	
Fan motor	Model		RA6V85-AA	
	Winding resistance(at20℃)	Ω	WHT-BLK 62.7 BLK-YLW 30.2 YLW-RED 62.9	
	Dimensions W×H×D	mm	870 X 850 X 295	
	Weight	kg	72	
Special remarks	Sound level(High)	dB	53	
	Fan speed(High)	rpm	720-750	
	Fan speed regulator		2	
	Refrigerant filling capacity(R22)	kg	2.40	
	Refrigerating oil (Model)	cc	1.2 (MS32N1)	
	Thermistor RT61(at0℃)	kΩ	33.18	
	Thermistor RT63(at0℃)	kΩ	33.18	

NOTE:Test conditions are based on ISO 5151

Cooling : Indoor DB27°C WB19°C Heating : Indoor DB20°C WB15°C

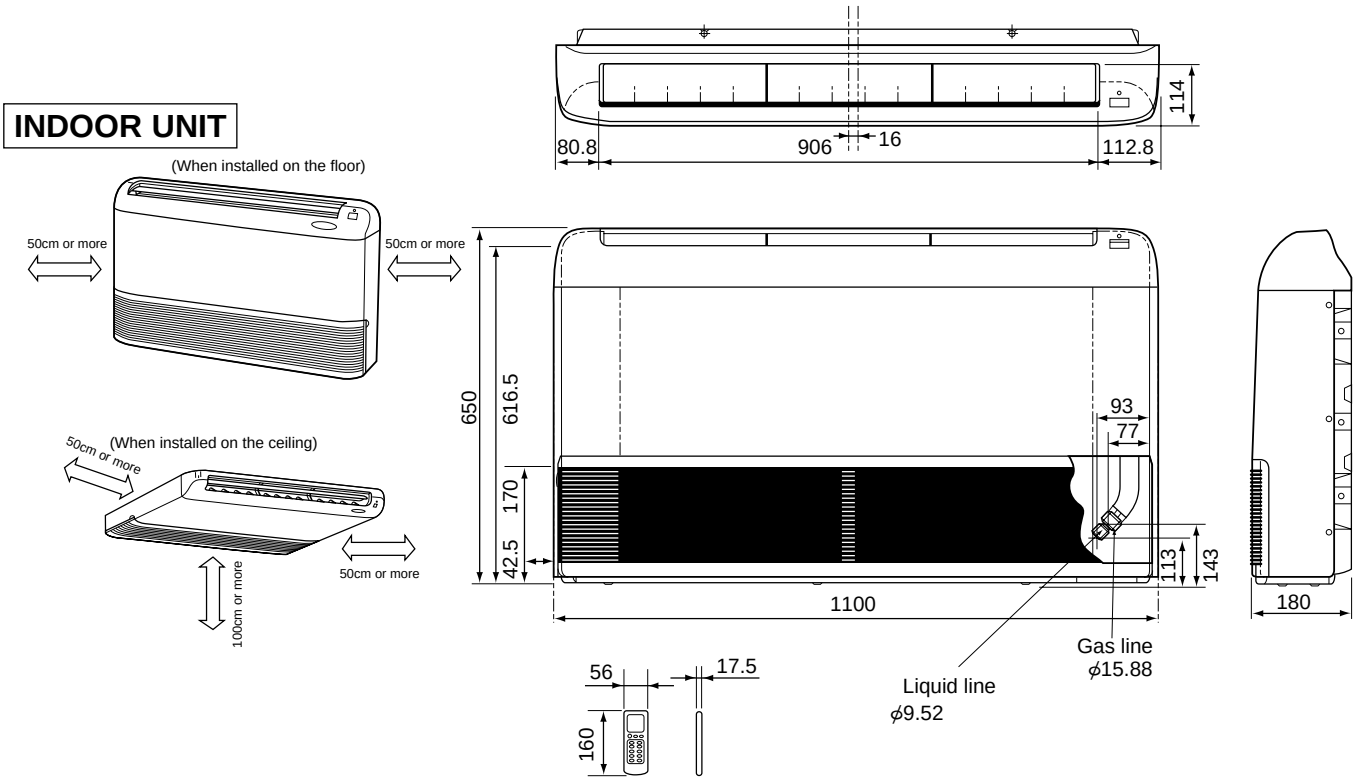
Outdoor DB35°C WB(24°C) Outdoor DB 7°C WB 6°C

4 OUTLINES AND DIMENSIONS

MCFH-24NV - EB

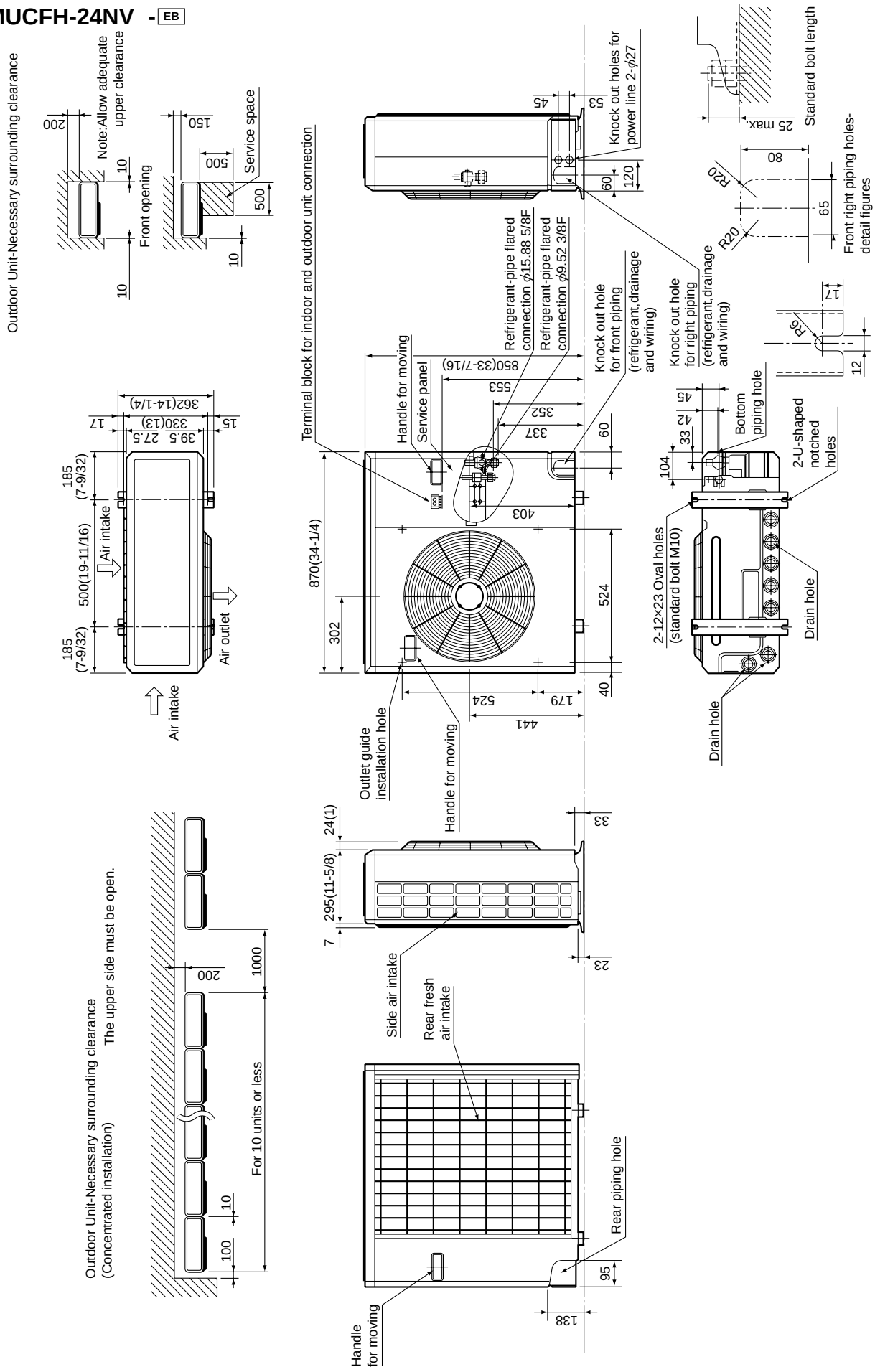
Unit: mm

INDOOR UNIT



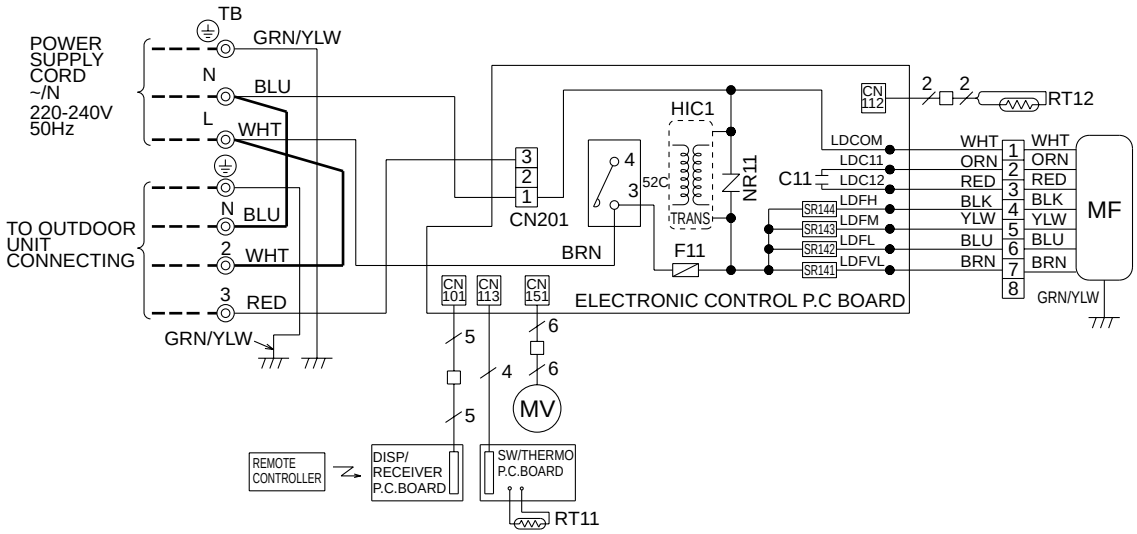
MUCFH-24NV - EB

Unit: mm



5 WIRING DIAGRAM

INDOOR UNIT MODEL MCFH-24NV- EB



SYMBOL	NAME	SYMBOL	NAME	SYMBOL	NAME
C11	FAN MOTOR CAPACITOR	MV	VANE MOTOR	SR142~SR144	SOLID STATE RELAY
F11	FUSE (3.15A)	NR11	VARISTOR	TB	TERMINAL BLOCK
HIC1	DC/DC CONVERTER	RT11	ROOM TEMP. THERMISTOR	52C	CONTACTOR
MF	FAN MOTOR(INNER PROTECTOR)	RT12	COIL TEMP. THERMISTOR		

NOTE:1. About the outdoor side electric wiring, refer to the outdoor unit electric wiring diagram for servicing.
2. Use copper conductors only.(For field wiring)
3. Symbols below indicate;
◎: Terminal block, □□□□: Connector

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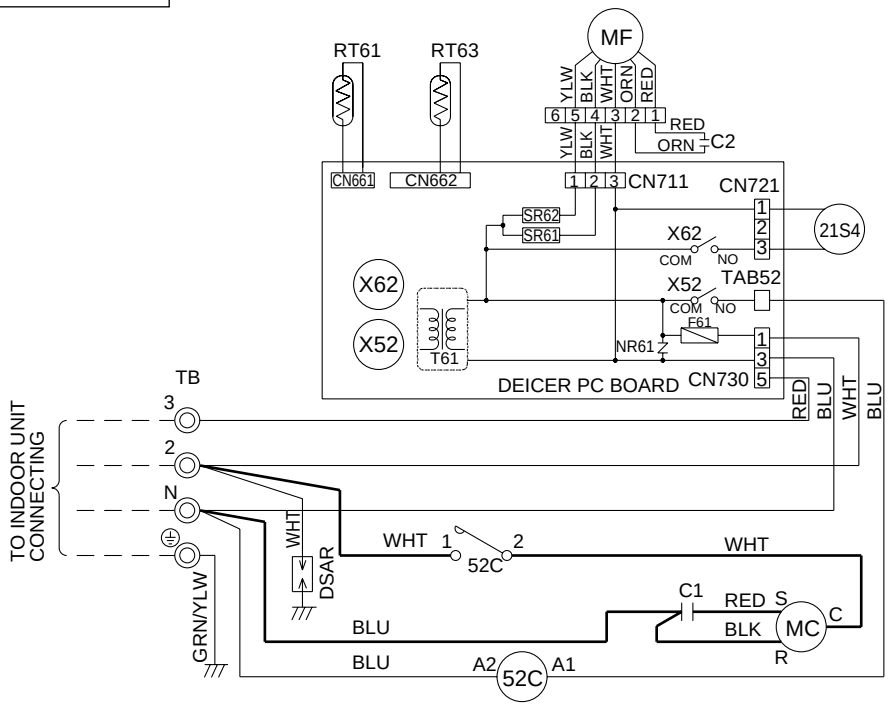
OUTDOOR UNIT MODEL MUCFH-24NV- EB



SYMBOL	NAME	SYMBOL	NAME	SYMBOL	NAME
C1	COMPRESSOR CAPACITOR	NR61	VARISTOR	T61	TRANSFORMER
C2	FAN MOTOR CAPACITOR	RT61	DEFROST TEMPERATURE THERMISTOR	X52	CONTACTOR
DSAR	SURGE ABSORBER	RT63	AMBIENT TEMPERATURE THERMISTOR	X62	R.V. COIL RELAY
F61	FUSE(3.15A)	SR61	SOLID STATE RELAY	21S4	R.V. COIL
MC	COMPRESSOR (INNER PROTECTOR)	SR62	SOLID STATE RELAY	52	COMPRESSOR CONTACTOR
MF	FAN MOTOR (INNER PROTECTOR)	TB	TERMINAL BLOCK		

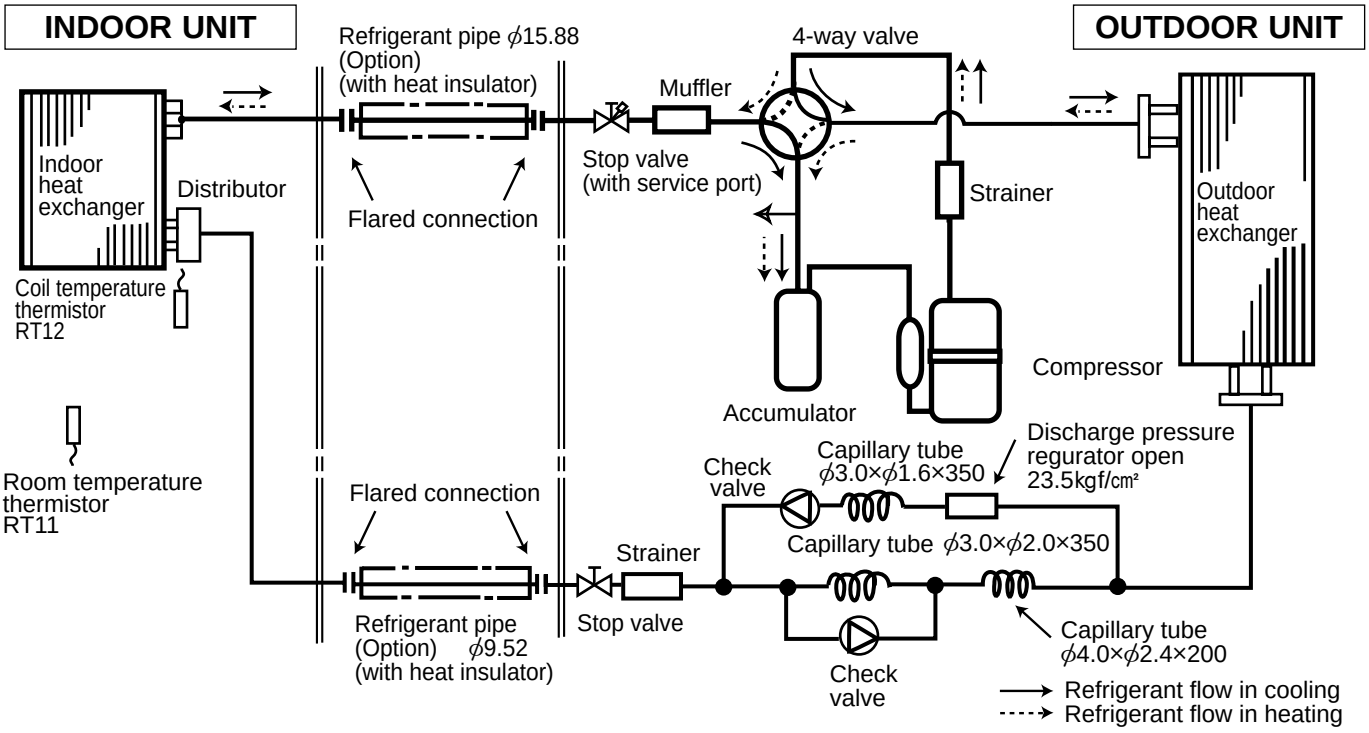
NOTES: 1.Use copper conductors only (For field wiring).
2.Since the indoor and outdoor unit connecting wires have polarity, connect them according to the numbers (3,2,N).
3.Symbols below indicate.
◎:Terminal block, □□□□ :Connector

SG79J186H01

6 REFRIGERANT SYSTEM DIAGRAM

MCFH-24NV- EB

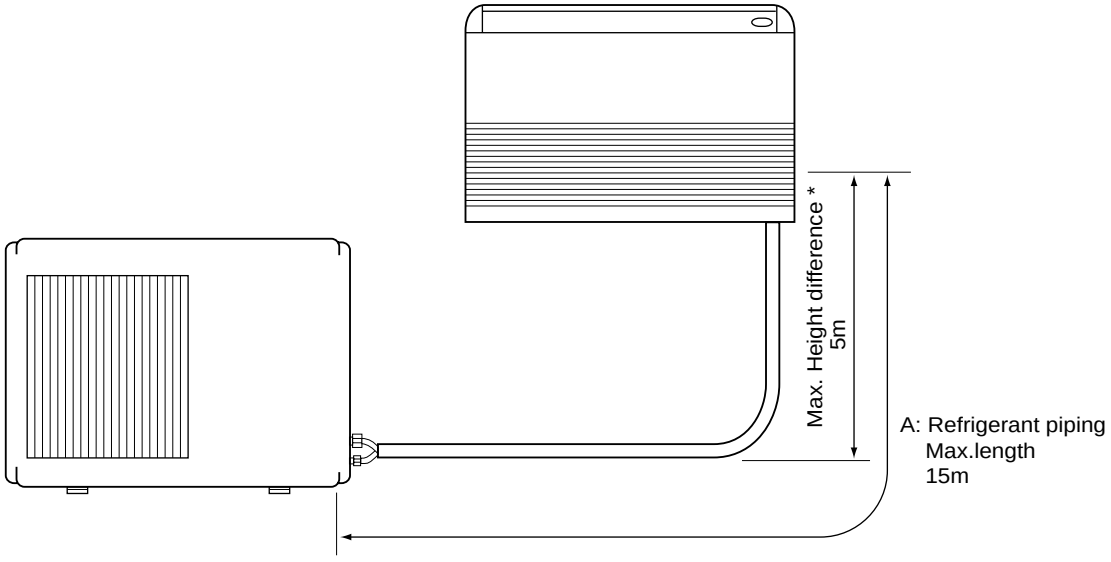
MUCFH-24NV- EB



MAX. REFRIGERANT PIPING LENGTH & MAX. HEIGHT DIFFERENCE

Models	Refrigerant piping MAX. length : m A	Piping size O.D. : mm	
		Gas	Liquid
MCFH-24NV - EB	15	ϕ15.88	ϕ9.52

※It does not matter which unit is higher.



ADDITIONAL REFRIGERANT CHARGE (R22 : g)

If pipe length exceeds 7m, additional refrigerant (R22) charge is required

Models	Outdoor unit:precharged (up to 7m)	Refrigerant piping length (one way)								
		7m	8m	9m	10m	11m	12m	13m	14m	15m
MCFH-24NV - EB	2,400	0	65	130	195	260	325	390	455	520

Calculation : ×g=65g/m×(Refrigerant piping length minus 7m)

7 PERFORMANCE CURVES

The standard data contained in these specifications apply only to the operation of the air conditioner under normal condition. Operating conditions vary according to the areas where these units are installed. The following information has been provided to clarify the operating characteristics of the air conditioner under the conditions indicated by the performance curve.

(1) GUARANTEED VOLTAGE

198~264V, 50Hz

(2) AIR FLOW

Air flow should be set at MAX..

(3) MAIN READINGS

COOLING

(1) Indoor intake air wet-bulb temperature : ˚CWB
(2) Indoor outlet air wet-bulb temperature : ˚CWB
(3) Outdoor intake air dry-bulb temperature : ˚CDB
(4) Total input : W

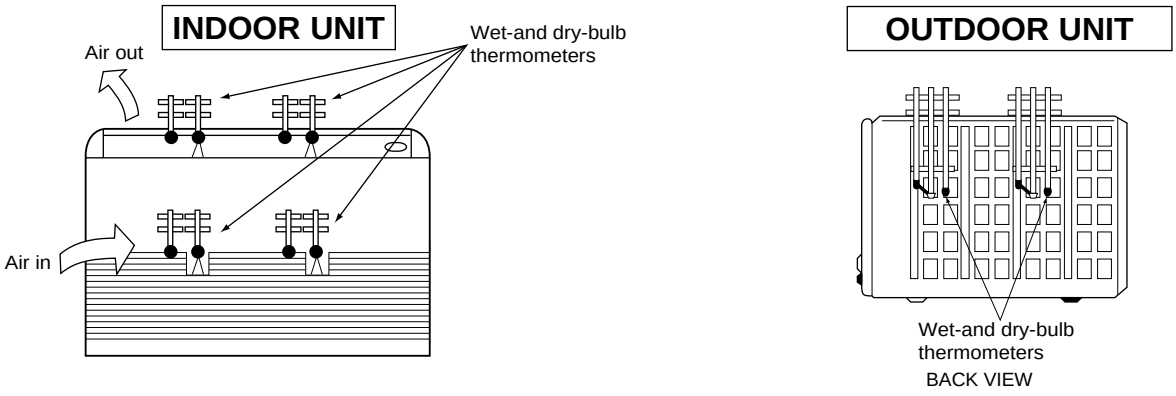
HEATING

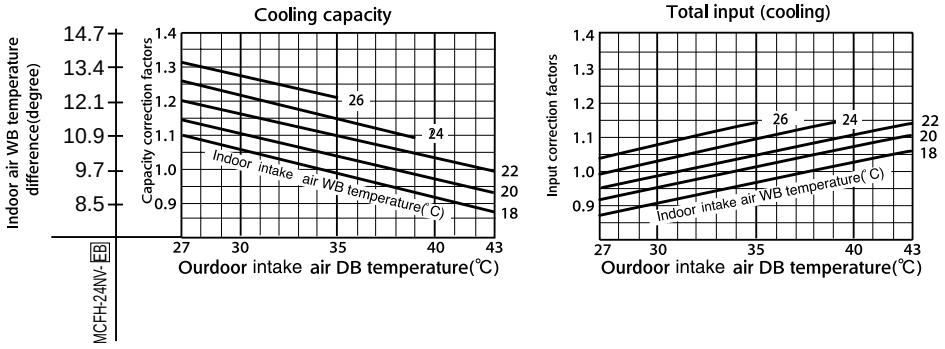
(1) Indoor intake air dry-bulb temperature : ˚CDB
(2) Indoor outlet air dry-bulb temperature : ˚CDB
(3) Outdoor intake air wet-bulb temperature : ˚CWB
(4) Total input : W

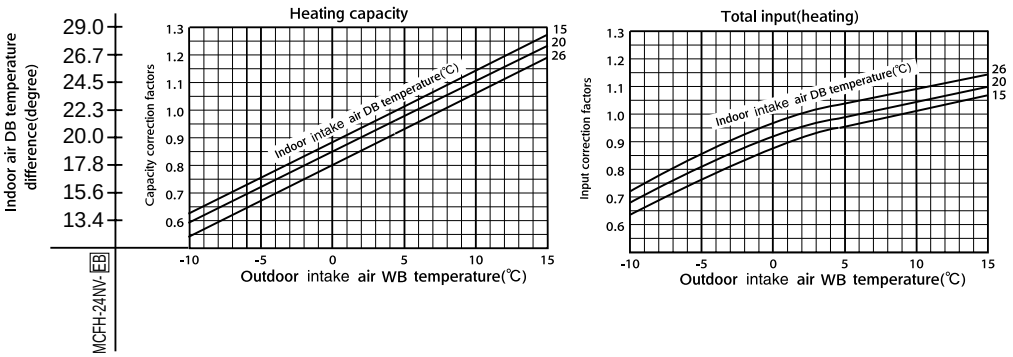
Indoor air wet/dry-bulb temperature difference on the left side of the chart on page 16 shows the difference between the indoor intake air wet/dry-bulb temperature and the indoor outlet air wet/dry-bulb temperature for your reference at service.

How to measure the indoor air wet-bulb/dry-bulb temperature difference

1. Attach at least 2 sets of wet-and-dry-bulb thermometers to the indoor air inlet as shown in the figure, and at least 2 sets of wet-and-dry-bulb thermometers to the indoor air outlet. The thermometers must be attached to the position where air speed is high.
2. Attach at least 2 sets of wet-and-dry-bulb thermometers to the outdoor air inlet.
   Cover the thermometers to prevent direct rays of the sun.
3. Check that the air filter is cleaned.
4. Open windows and doors of the room.
5. Press the EMERGENCY OPERATION switch once(twice) to start the EMERGENCY COOL(HEAT) MODE.
6. When system stabilizes after more than 15 minutes, measure temperature and take an average temperature.
7. 10 minutes later, measure temperature again and check that the temperature does not change.







OUTDOOR LOW PRESSURE AND OUTDOOR UNIT CURRENT

COOL operation

① Both indoor and outdoor units are under the same temperature/humidity condition.

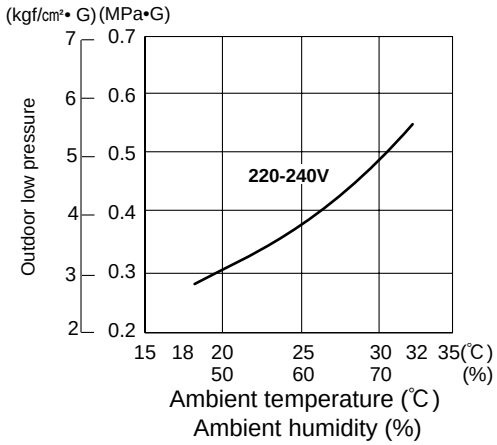
Dry Bulb temperature (˚C)	Relative humidity (%)
20	50
25	60
30	70

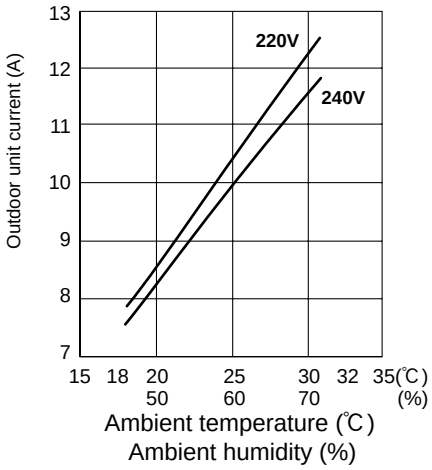
② Air flow should be set at MAX..

③ The unit of pressure has been changed to MPa on the international system of units(SI unit system). The converted score against the traditional unit system can be gotten according to the formula below.

1(MPa • G) =10.2(kgf/㎠ • G)

MUCFH-24NV- EB

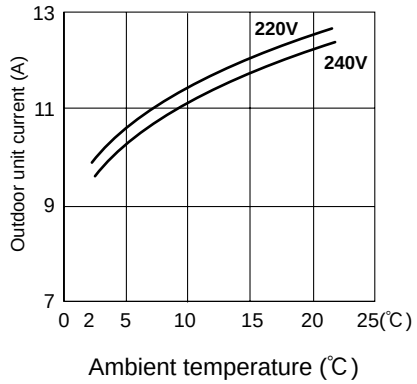




HEAT operation

Condition Indoor : Dry bulb temerature 20.0℃
Wet bulb temerature 14.5℃

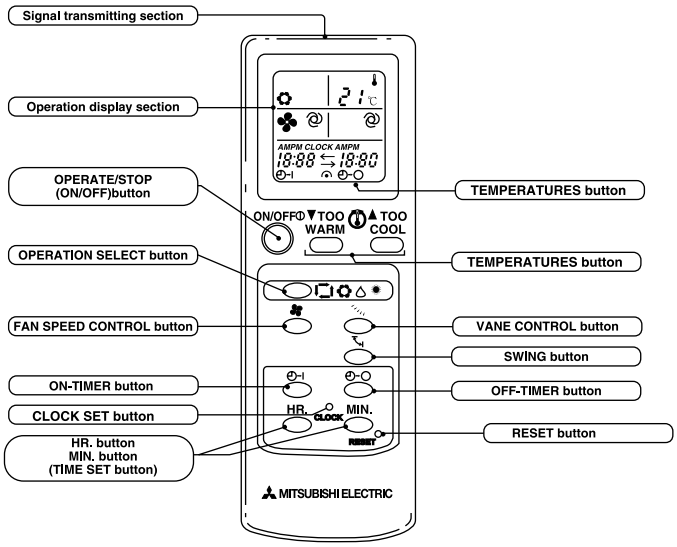
Outdoor : Dry bulb temerature 7, 15, 21℃
Wet bulb temerature 6, 13, 15.3℃



8 MICROPROCESSOR CONTROL

MCFH-24NV -EB MUCFH-24NV -EB

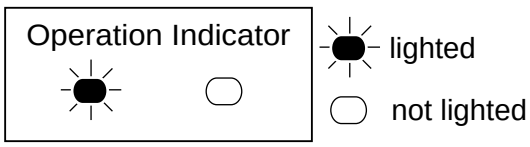
WIRELESS REMOTE CONTROLLER



INDOOR UNIT DISPLAY SECTION

OPERATION INDICATOR lamp

The operation indicator at the right side of the indoor unit indicates the operation state.



Indication	Operation state	Difference between set temperatuer and room temperature
☀ ☀	This shows that the air conditioner is operating to reach the target temperature. Please wait until the target temperature is obtained.	Approx. 2 ℃ or more
☀ ▭	This shows that the room temperature is approaching the target temperature.	Approx. 2 ℃ or less

Once the operation mode are set, the same operation mode can be repeated by simply turning the OPERATE/STOP button ON.
Indoor unit receives the signal with a beep tone.
When the system turns off, 3-minute time delay will operate to protect system from overload and compressor will not restart for 3 minutes.

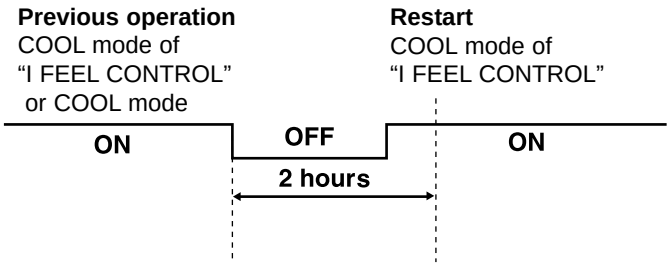
8-1. "I FEEL CONTROL"(▭) OPERATION

(1) Press OPERATE/STOP button on the remote controller. OPERATION INDICATOR lamp of the indoor unit will turn on with a beep tone.
(2) Press OPERATION SELECT button to set "I FEEL CONTROL"(▭). Then a beep tone is heard.
(3) The operation mode is determined by the initial room temperature at start-up of the operation.

Initial room temperature	mode
more than 25°C	COOL mode of "I FEEL CONTROL"
23.0°C to 25°C	DRY mode of "I FEEL CONTROL"
less than 23°C	HEAT mode of "I FEEL CONTROL"

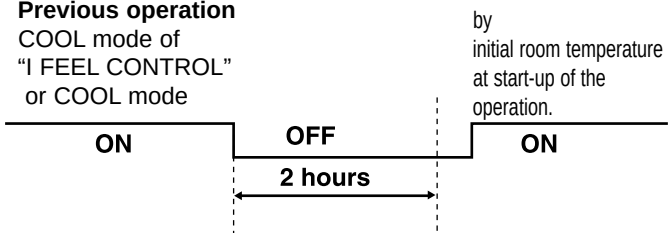
- Once the mode is fixed, the mode will not change by room temperature afterwards.
- Under the ON-TIMER(⏲—|) timer operation, mode is determined according to the room temperature as the operation starts.
- When the system is stopped with the OPERATE/ STOP button on the remote controller, and restarted within 2 hours in "I FEEL CONTROL"(▭) mode, the system operates in previous mode automatically regardless of the room temperature.

Example



- When the system is restarted after 2 hours, the operation mode is determined by the initial room temperature at start-up of the operation.

Example



(4) The initial set temperature is decided by the initial room temperature.

Model	Initial room temperature	Initial set temperature	
COOL mode of "I FEEL CONTROL"	26°C or more	24°C	※1
	26°C or less	Initial room temperature minus 2°C	
DRY mode of "I FEEL CONTROL"	23°C to 25°C	Initial room temperature minus 2°C	
HEAT mode of "I FEEL CONTROL"	23°C or less	26°C	

※1 After the system restarts by the remote controller, the system operates with the previous set temperature regardless of the initial set temperature.
The set temperature is calculated by the previous set temperature.

(5) TEMPERATURE buttons

In "I FEEL CONTROL" mode, set temperature is decided by the microprocessor based on the room temperature.
In addition, set temperature can be controlled by or TOO WARM or TOO COOL buttons when you feel too warm or too cool.
Each pressing the TOO WARM or TOO COOL button ,indoor unit receives the signal a beep tone.

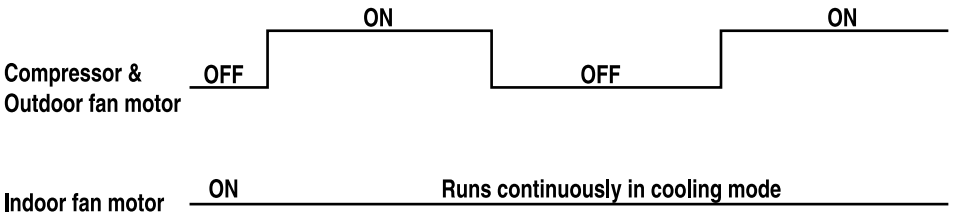
● **Fuzzy control**

When the TOO COOL or TOO WARM button is pressed, the microprocessor changes the set temperature, considering the room temperature, the frequency of pressing TOO COOL or TOO WARM button and the user's preference to heat or cold. So this is called "Fuzzy control", and works only in "I FEEL CONTROL" operation.
In DRY mode of "I FEEL CONTROL", the set temperature doesn't change.

▲TOO
COOL ··· To raise the set temperature 1~2 degrees(°C)

▼ TOO
WARM ··· To lower the set temperature 1~2 degrees(°C)

— COOL mode of “I FEEL CONTROL” —



NOTE : Coil frost prevention during COOL mode of “I FEEL CONTROL”

There are two types of controls in coil frost prevention as follows.

① Temperature control

When the indoor coil thermistor RT12 reads -1°C or below, the coil frost prevention mode starts immediately.
However the coil frost prevention will not work for 5 minutes after the compressor starts.
During the coil frost prevention compressor stops and the indoor fan operates at the set speed for 5 minutes.
After that, if RT12 still reads below -1°C, this mode is prolonged until the RT12 reads over -1°C.

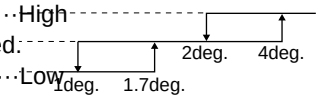
② Time control

When the three conditions below have been satisfied for 1 hour and 45 minutes, compressor stops for 3 minutes.
a. Compressor has been continuously operating.
b. Indoor fan speed is Low or Med..
c. Room temperature is below 26°C.
When compressor stops ,the accumulated time is cancelled and when compressor restarts, time counting starts from the beginning.
Time counting also stops temporarily when the indoor fan speed becomes High or the room temperature exceeds 26°C.
However, when two of the above conditions (b.And c.) are satisfied again time accumulation is resumed.

● Indoor fan operates at the set speed by FAN SPEED CONTROL button.

Followings are the fan speed in AUTO.

Initial temperature difference	Fan speed
Room temperature minus set temperature : 2 degrees or more	High
Room temperature minus set temperature : 1 degree or more and less than 2 degrees	Med.
Room temperature minus set temperature : less than 1 degree	Low



—DRY mode of “I FEEL CONTROL”—

The system for dry operation uses the same refrigerant circuit as the cooling circuit.
The compressor and the indoor fan are controlled by the temperature and the microprocessor.
By such controls, indoor air flow amounts will be reduced in order to lower humidity without much room temperature decrease.
The operation of the compressor and indoor fan is as follows.

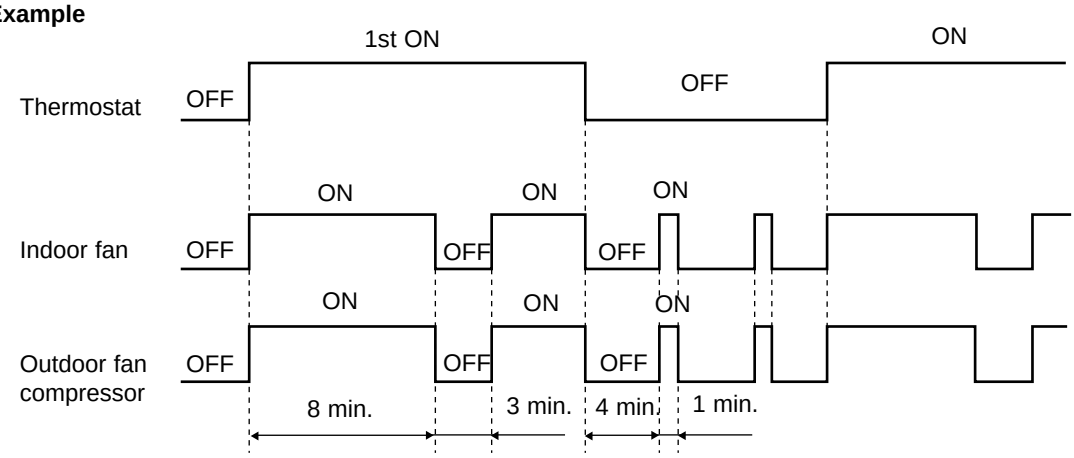
1. When the room temperature is 23°C or over:

Compressor operates by temperature control and time control.
① Set temperature is controlled to fall 2°C above from initial set temperature.
② When the thermostat is ON, the compressor repeats 8 minutes ON and 3 minutes OFF.
When the thermostat is OFF, the compressor repeats 4 minutes OFF and 1 minute ON.
Indoor fan and outdoor fan operate in the same cycle as the compressor.

2. When the room temperature is under 23°C.

When the thermostat is ON, the compressor repeats 2 minutes ON and 3 minutes OFF.
When the thermostat is OFF, the compressor repeats 4 minutes OFF and 1 minute ON.

Operation time chart
Example



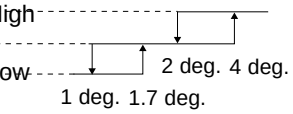
NOTE ● Coil frost prevention during DRY mode of "I FEEL CONTROL"
The operation is same as that of coil frost prevention during COOL mode of "I FEEL CONTROL". However the indoor fan speed becomes the set speed or Low.

— HEAT mode of "I FEEL CONTROL" —

1. Indoor fan speed control

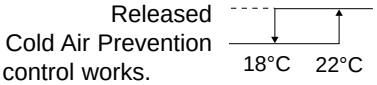
(1) Followings are the fan speed in AUTO.

Initial temperature difference	Fan speed
Room temperature minus set temperature: 2 degrees or more	High
Room temperature minus set temperature: 1 degree or more and less than 2 degrees	Med.
Room temperature minus set temperature: less than 1 degree	Low



(2) Cold air prevention control

The fan runs at set speed when the indoor coil thermistor RT12 temperature exceeds 22°C. The fan operates at Very Low when the temperature is below 18°C. But the fan stops when the indoor fan operates at Very Low and the room temperature is 15°C or less.



NOTE : At initial in hysteresis this control works.

(3) New warm air control.

When compressor starts in heating operation or after defrosting, the fan changes the speed with dependence on the indoor coil thermistor RT12 temperature to blow out warm air.
After releasing of cold air prevention, when the indoor coil temperature is 37°C or above, the fan speed shifts to the set speed, and when the fan speed is changed by the remote controller, the fan speed is the set speed.
When the indoor coil temperature is less than 37°C, the fan speed is controlled by time as below.

<Time condition>	<Indoor fan speed>
less than 2 minutes	Low
2 minutes to 4 minutes	Med.
4 minutes or more	High

The upper limit of the fan speed is the set speed.
If the thermostat turns off, this operation changes to flow soft control.

(4) Flow soft control

After the thermostat turns off, the indoor fan operates at Very Low.

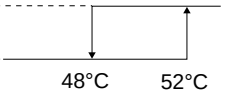
NOTE : When the thermostat turns on, the fan operates at the set speed. Due to the cold air prevention control, the fan does not start until the indoor coil thermistor RT12 reads 22°C or more.

2. High pressure protection

During heating operation, the outdoor fan motor is controlled by the indoor coil thermistor RT12 temperature for excess rise protection of compressor discharge pressure.

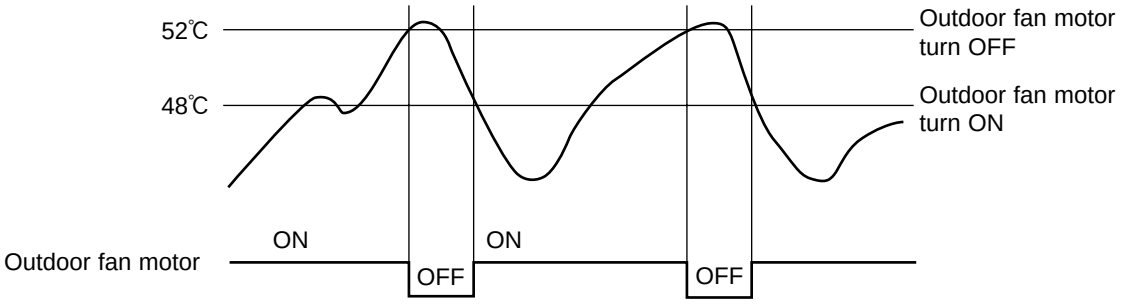
Outdoor fan OFF : OFF

Outdoor fan ON : ON



High pressure protection time chart

Indoor coil thermistor
RT12 temperature



NOTE : When the outdoor fan is OFF in heating, defrosting of outdoor heat exchanger is not detected by the defrost thermistor RT61.

3. Defrosting

Defrosting of outdoor heat exchanger is controlled by deicer P.C. board, with detection by the defrost thermistor RT61.

(1) Defrost starting conditions

When all conditions of a) ~ c) are satisfied, the defrosting operation starts.

a) Under the heat operation, the compressor cumulative operation time exceeds 40 minutes without the defrosting operation working.

b) The defrost thermistor RT61 reads - 3°C or less.

c) After releasing the high pressure protection, 4 minutes and 15 seconds have elapsed.

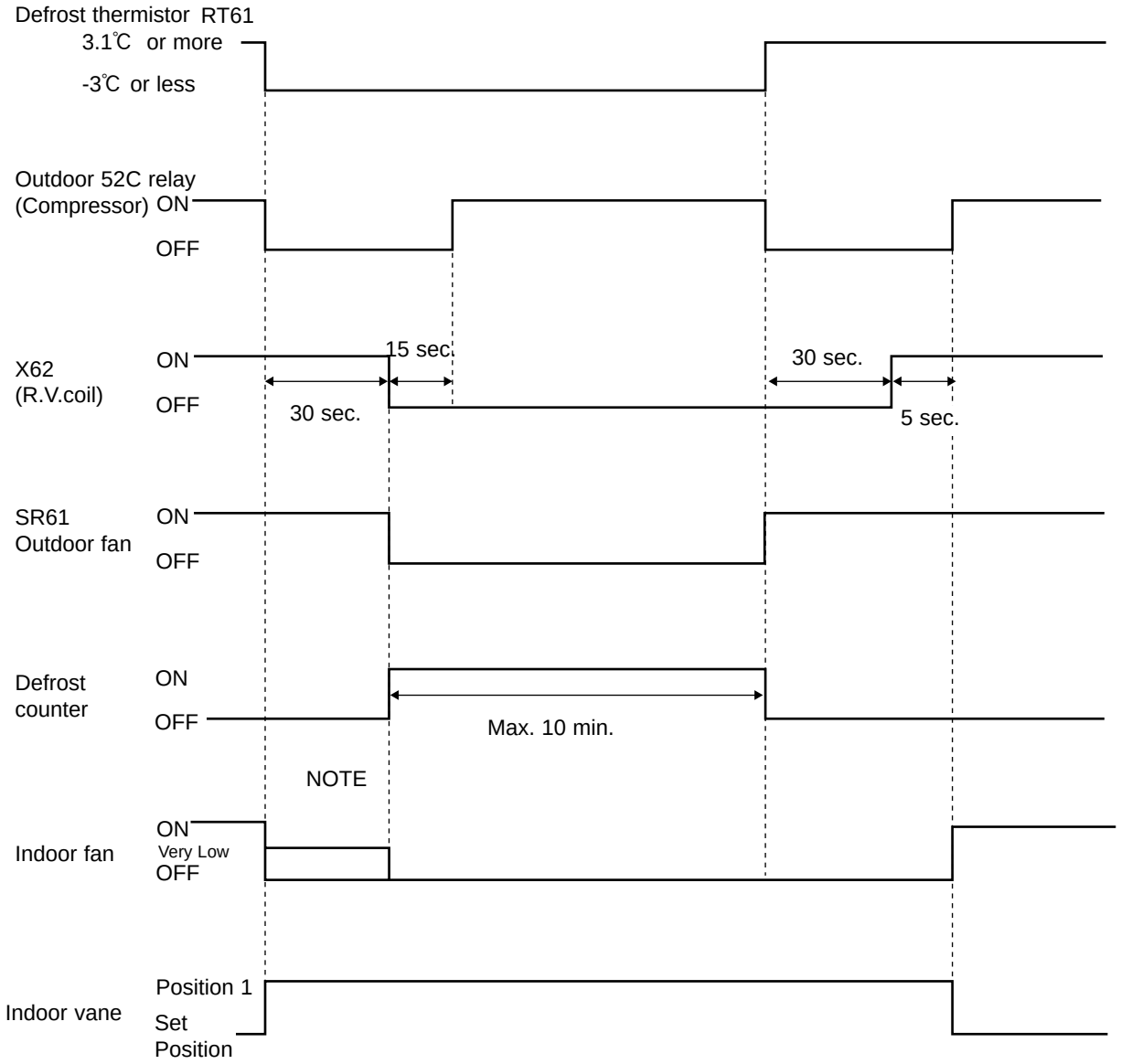
(2) Defrost terminating conditions

When the condition d) or e) is satisfied, the defrosting operation stops.

d) The defrost thermistor RT61 reads 3.1°C or more.

e) The defrosting time exceeds 10 minutes.

(3) Defrosting time chart

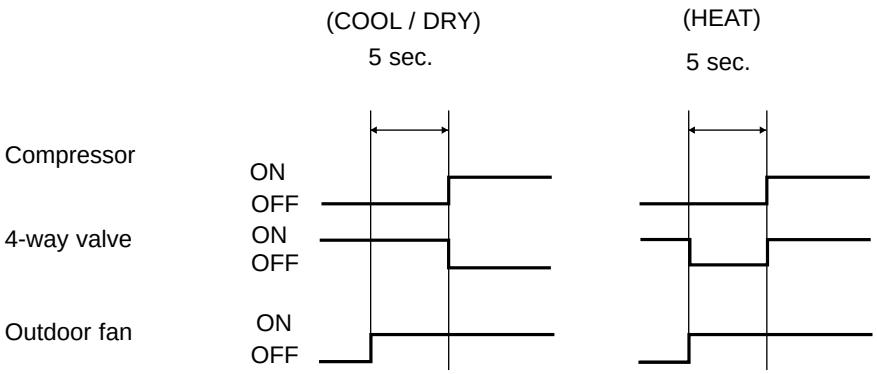


NOTE ● When the indoor coil thermistor reads above 18°C, indoor fan operates at Very Low for 30 seconds.
● When the indoor coil thermistor reads 18°C or less, the indoor fan stops.

4. 4-way valve control

Heating · · · · · ON
Cooling · · · · · OFF
Dry · · · · · · · · OFF

NOTE: The 4-way valve reverses for 5 seconds right before start-up of the compressor.

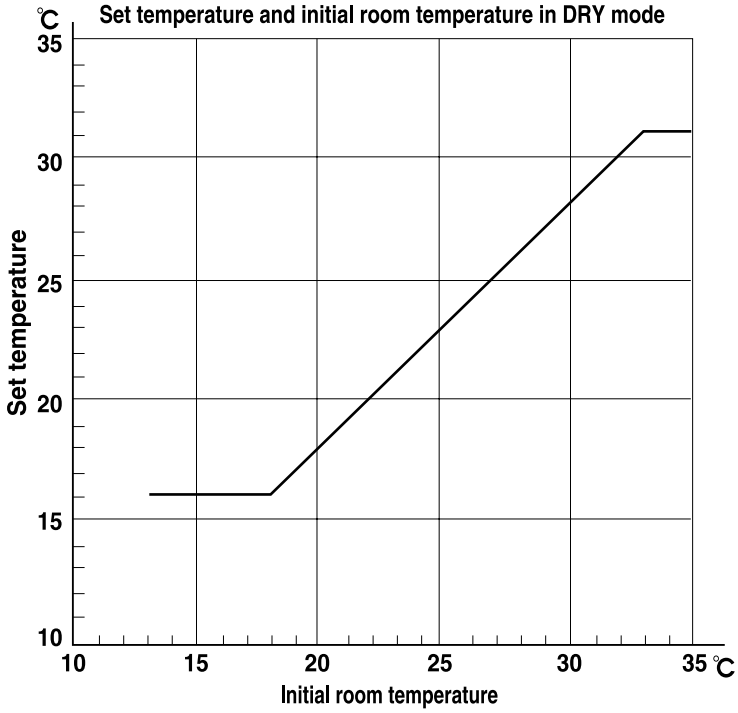


8-2. COOL (✿)OPERATION

(1) Press OPERATE/STOP button.
OPERATION INDICATOR lamp of the indoor unit turns on with a beep tone.
(2) Select COOL mode.
(3) Set the desired temperature with the TEMPERATURES button.
(TOO WARM or TOO COOL button)
The setting range is 16 ~ 31°C
※ Indoor fan continues to operate regardless of thermostat's OFF-ON
※ Coil frost prevention is same as COOL mode of "I FEEL CONTROL"

8-3. DRY (♤) OPERATION

(1) Press OPERATE/STOP button.
OPERATION INDICATOR lamp of the indoor unit turns on with a beep tone.
(2) Select DRY mode.
(3) The microprocessor reads the room temperature and determines the set temperature. Set temperature is as shown in the right chart.
Thermostat (SET TEMP.)does not work.
The other operations are same as DRY mode of "I FEEL CONTROL".
(4) DRY operation will not work when the room temperature is 13°C or below.



8-4. HEAT (☼) OPERATION

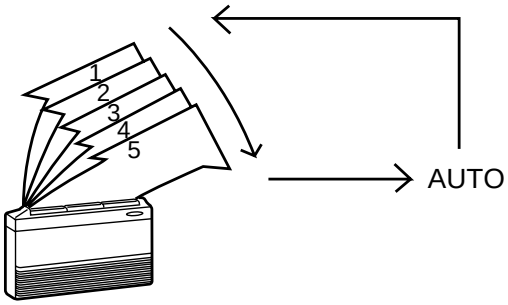
(1) Press OPERATE/STOP button.
OPERATION INDICATOR lamp on the indoor unit turns on with a beep tone.
(2) Select HEAT mode.
(3) Press TEMPERATURES button (TOO WARM or TOO COOL button) to select the desired temperature.
The setting range is 16 ~ 31°C.
(4) Indoor fan speed control, high pressure protection, defrosting, 4-way valve control are same as HEAT mode of "I FEEL CONTROL".

8-5. AUTO VANE OPERATION

(1) Vane motor drive

This series is equipped with a stepping motor for the vane. The rotating direction, speed, and angle of the motor are controlled by pulse signals (approx. 12V, transmitted from indoor microprocessor.)

(2) Each time the VANE CONTROL button is pressed, angle of horizontal vane is changed in sequence, from 1,2,3,4,5 to AUTO.



(3) Positioning

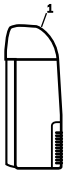
The vane is once pressed to the vane stopper to confirm the standard position and then set to the desired angle.
The positioning is decided as follows.

(a) When the OPERATE/STOP button is pressed (POWER ON/OFF).
(b) When the vane control is changed from AUTO to MANUAL.
(c) When the SWING is finished.
(d) When the test run starts.
(e) When the power supply turns ON.

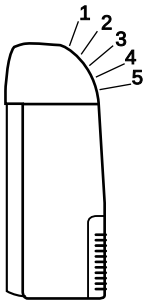
(4) VANE AUTO mode

In VANE AUTO mode, the microprocessor automatically determines the vane angle and operation to make the optimum room-temperature distribution.

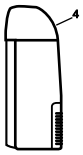
1.In COOL and DRY operation



Vane angle is fixed to position 1.



2.In FAN operation



Vane angle is fixed to position 4.

(5) Dew prevention

During COOL or DRY operation at position 4 or 5 when the compressor cumulative operation time exceeds 1 hour, the angle of horizontal vane automatically changes to Position 1 for dew prevention.

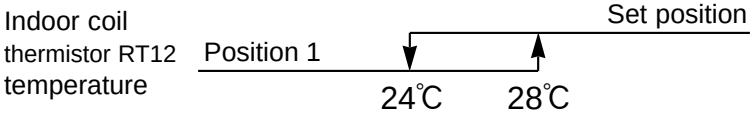
(6) SWING ( )MODE

By pressing the SWING button" ", horizontal vane swings vertically between Position 1 and 5 in COOL and DRY operation, between Position 2 and 4 in HEAT operation. The remote controller displays " ".If the VANE CONTROL button " " or SWING button " " button is pressed during SWING mode or the operation stops or changes to other mode, SWING mode is released.

(7) Cold air prevention in HEAT operation.

When any of the following conditions occurs in HEAT operation, the vane angle changes to Angle 1 automatically to prevent cold air blowing on users.

① Compressor is not operating.
② Defrosting is performed.
③ Indoor coil thermistor RT12 reads 24℃ or below.
④ Indoor coil thermistor RT12 temperature is raising from 24℃ or below, but it does not exceed 28℃.



NOTE : At initial in hysteresis this control works.

8-6. TIMER OPERATION

1. How to set the timer

(1) Press OPERATE/STOP button to start the air conditioner.
(2) Check that the current time is set correctly.
NOTE : Timer operation will not work without setting the current time. Initially “AM0:00” blinks at the current time display of TIME MONITOR, so set the current time correctly with CLOCK SET button.
(3) Press ON-TIMER, OFF-TIMER button to select the operation.
◴→| button ... AUTO START operation (ON timer)
◴→ ◯ button ... AUTO STOP operation (OFF timer)
(4) Press HR. and MIN. button to set the timer. Time setting is 10-minute units.
HR. and MIN. button will work when ◴→| or ◴→ ◯ button is flashing on and off.
These marks disappear in 1 minute.
When setting the ON timer, check that POWER MONITOR lamp of the indoor unit lights.
NOTE 1 : Be sure to place the remote controller at the position where its signal can reach the air conditioner even during TIMER operation, or the set time may deviate within the range of about 10 minutes.
NOTE2 : Reset the timer in the following cases, or the set time may deviate and other malfunctions may occur.
- A power failure occurs.
- The circuit breaker functions.

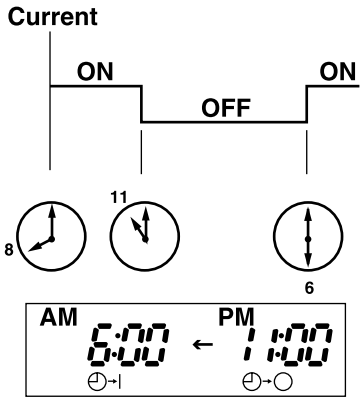
2. Cancel

Timer setting can be cancelled with the TIMER CONTROL buttons. (◴→| or ◴→ ◯)
To cancel the ON timer, press the ◴→| button.
To cancel the OFF timer, press the ◴→ ◯ button.
Timer is cancelled and the display of set time disappears.

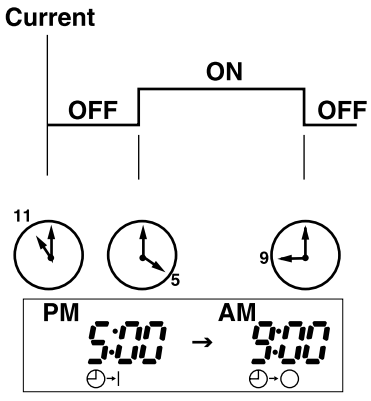
PROGRAM TIMER

- The OFF timer and ON timer can be used in combination.
- “→” and “←” display show the order of the OFF timer and ON timer operation.

(Example 1) The current timer is 8:00 PM.
The unit turns off at 11:00 PM, and on at 6:00 AM.



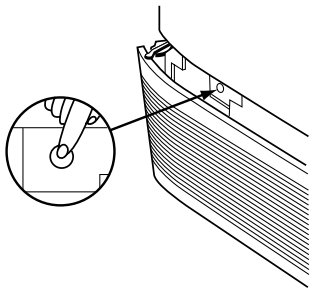
(Example 2) The current time is 11:00 AM.
The unit turns on at 5:00 PM, and off at 9:00 PM.



8-7. EMERGENCY-TEST OPERATION

When the remote controller is missing, has failed or the batteries run down, press the EMERGENCY OPERATION switch on the front of the indoor unit. The unit will start and the OPERATION INDICATOR lamp will light.
The first 30 minutes of operation will be the test run operation. This operation is for servicing. The indoor fan runs at high speed and the system is in continuous operation. The thermostat is ON and the timer is reset to normal.
After 30 minutes of test run operation the system shifts to EMERGENCY COOL, HEAT MODE with a set temperature of 24˚C. The fan shifts to Med. speed.
This operation continues until the EMERGENCY OPERATION switch is pressed or a button on the remote controller is pressed, then normal operation will start.
The coil frost prevention circuit operates in this operation,and defrosting operates too.
In the test run or emergency operation, the horizontal vane operates in AUTO mode with a set temperature of 24˚C.
Defrosting of outdoor heat exchanger works in EMERGENCY HEAT MODE.
NOTE : Do not press the EMERGENCY OPERATION switch during normal operation.

EMERGENCY OPERATION switch



OPERATION INDICATOR

Press once <Cool>	☀	□
Press again <Heat>	□	☀
Press once again <Stop>	□	□

9 SERVICE FUNCTIONS

MCFH-24NV -EB

9-1. TIMER SHORT MODE

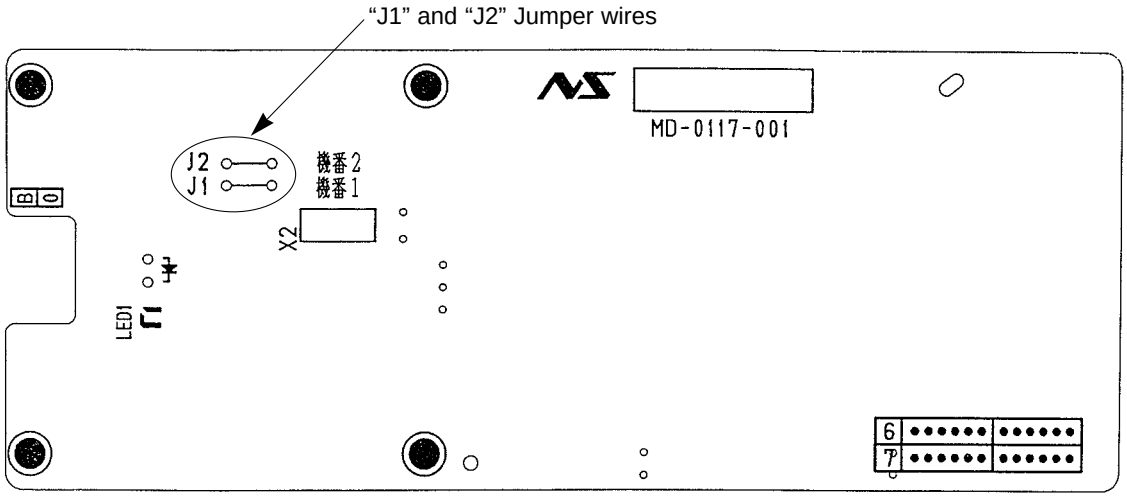
For service, set time can be shortened by short circuit of JPG and JPS on the electronic control P.C. board.
The time will be shortened as follows.
3-minute time delay : 3-minute → 3-second.
AUTO START : 1 hour → 1-minute
AUTO STOP : 1 hour → 1-minute
} Short the connector during the timer mode.

9-2. P.C. BOARD MODIFICATION FOR INDIVIDUAL OPERATION

A maximum of 4 indoor units with wireless remote controllers can be used in a room. In this case, to operate each indoor unit individually by each remote controller, P.C. boards of remote controller must be modified according to the indoor unit number.

(1) How to modify the remote controller P.C. board

Remove batteries before modification.
The board has a print as shown below;



NOTE : For remodelling, take out the batteries at first.
After finishing remodelling, put back the batteries then press the RESET-button.

The P.C. board has the print "J1" and "J2". Jumper wires are mounted to each "J1" and "J2". Cut J1 and J2 according to the number of indoor unit as shown in Table 1.
After modification, press the RESET button near the MIN.button on the remote controller.

Table1.

	1 unit operation	2 unit operation	3 unit operation	4 unit operation
No.1 unit	No modification	Same as at left	Same as at left	Same as at left
No.2 unit	————	Cut J1	Same as at left	Same as at left
No.3 unit	————	————	Cut J2	Same as at left
No.4 unit	————	————	————	Cut both J1 and J2

NOTE : At power supply failure or installation, indoor unit deletes the memory about remote controller.When the power supply is turned on and indoor unit receives the first signals from the remote controller, the remote controller number is designated as the indoor unit number.Therefore at and after the second time indoor unit accepts the remote controller of the initial setting number.At setting-error, turn the power supply off to cancel the individual operation and then turn the power supply on to restart the setting.

9-3. COMPULSORY DEFROSTING MODE FOR SERVICE

By short circuit of the connector JPG1 and R871 on the outdoor deicer P.C. board, defrosting mode can be accomplished regardless of the defrost interval restriction. See Page 33.

Defrost thermistor RT61 must be below -3℃.

9-4. DEFROST TERMINATION CHANGE

<JRF> when the JRF wire of the deicer P.C. board is cut, the defrost interval time will be changed.(See page 33.)
<JRG> when the JRG wire of the deicer P.C. board is cut, the defrost temperature will be changed.(See page 33.)

Model	Jumper wire	Change point
MCFH-24NV - EB	JRF	Defrost interval time changes from 40 minutes to 15minutes.
	JRG	Defrost start temperature does not change -3℃. Defrost finish temperature changes from 3℃ to 15℃.

10 TROUBLESHOOTING

MCFH-24NV -EB MUCFH-24NV -EB

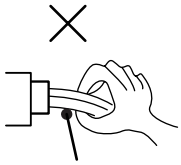
10-1. Cautions on troubleshooting

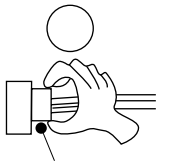
10-1-1. Before troubleshooting, check the followings:

1) Check the power supply voltage.
2) Check the indoor/outdoor connecting wire for mis-wiring.

10-1-2. Take care the followings during servicing.

1) Be sure to unplug the power cord before removing the air inlet grille, the front panel, the cabinet, the top panel, and the electronic control P.C. boards.
2) When removing the electronic control P.C. board, hold the edge of the board with care NOT to apply stress on the components.
3) When connecting or disconnecting the connectors, hold the housing of the connector. DO NOT pull the lead wires.





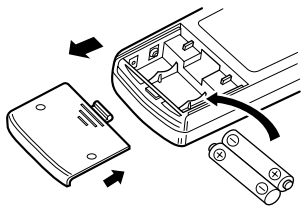
10-1-3. Troubleshooting procedure

1) First, check if the OPERATION INDICATOR lamp on the indoor unit is flashing on and off to indicate an abnormality. To make sure, check how many times the abnormality indication is flashing on and off before starting service work.
2) If the electronic control P.C. board is supposed to be defective, check the copper foil pattern for disconnection and the components for bursting and discoloration.
3) When troubleshooting, refer to the flow chart and the check table on page 24.

10-1-4 How to replace batteries

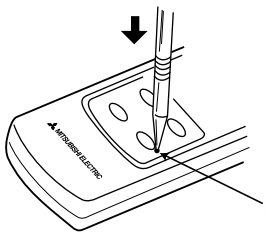
Weak batteries may cause the remote controller malfunction.
In this case, the remote controller can not be repaired only by the battery replacement. To operate the remote controller normally, discharge the remote controller in the following order.
This remote controller has the reset button. After refilling new batteries, press the reset button with tip end of ball point pen or the like, and then use the remote controller.

① Remove the back lid and replace batteries.
Then re-attach the back lid.



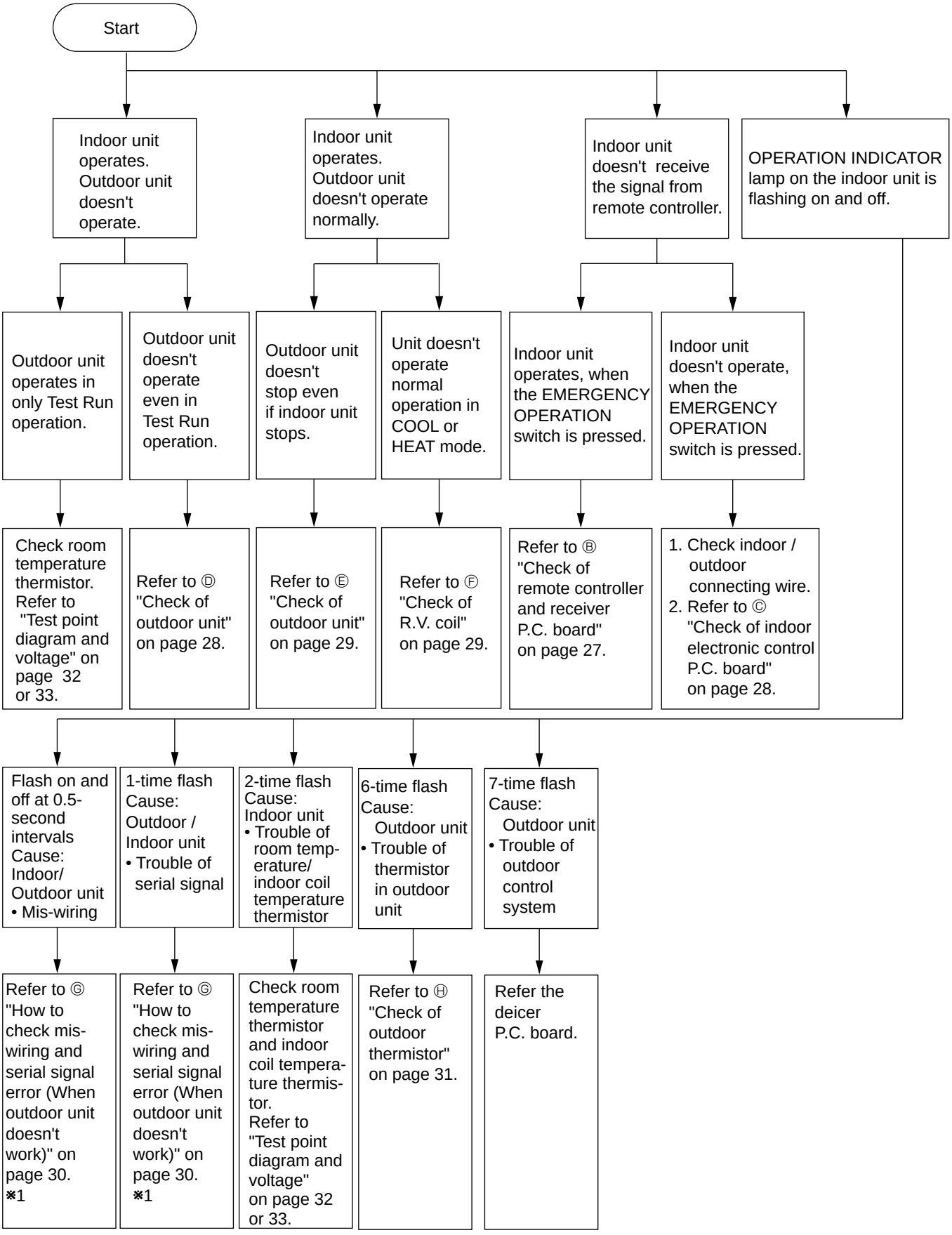
Insert the negative pole of the batteries first. Check if the polarity of the battereis is correct.

② Press the RESET button.



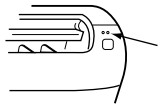
10-2. Instruction of troubleshooting

MCFH-24NV-EB


Start
Indoor unit operates. Outdoor unit doesn't operate.
Indoor unit operates. Outdoor unit doesn't operate normally.
Indoor unit doesn't receive the signal from remote controller.
OPERATION INDICATOR lamp on the indoor unit is flashing on and off.
Outdoor unit operates in only Test Run operation.
Outdoor unit doesn't operate even in Test Run operation.
Outdoor unit doesn't stop even if indoor unit stops.
Unit doesn't operate normal operation in COOL or HEAT mode.
Indoor unit operates, when the EMERGENCY OPERATION switch is pressed.
Indoor unit doesn't operate, when the EMERGENCY OPERATION switch is pressed.
Check room temperature thermistor. Refer to "Test point diagram and voltage" on page 32 or 33.
Refer to Ⓓ "Check of outdoor unit" on page 28.
Refer to Ⓔ "Check of outdoor unit" on page 29.
Refer to Ⓕ "Check of R.V. coil" on page 29.
Refer to Ⓑ "Check of remote controller and receiver P.C. board" on page 27.
1. Check indoor / outdoor connecting wire.
2. Refer to Ⓒ "Check of indoor electronic control P.C. board" on page 28.
Flash on and off at 0.5-second intervals Cause: Indoor/ Outdoor unit • Mis-wiring
1-time flash Cause: Outdoor / Indoor unit • Trouble of serial signal
2-time flash Cause: Indoor unit • Trouble of room temperature/ indoor coil temperature thermistor
6-time flash Cause: Outdoor unit • Trouble of thermistor in outdoor unit
7-time flash Cause: Outdoor unit • Trouble of outdoor control system
Refer to Ⓖ "How to check mis-wiring and serial signal error (When outdoor unit doesn't work)" on page 30. ※1
Refer to Ⓖ "How to check mis-wiring and serial signal error (When outdoor unit doesn't work)" on page 30. ※1
Check room temperature thermistor and indoor coil temperature thermistor. Refer to "Test point diagram and voltage" on page 32 or 33.
Refer to Ⓗ "Check of outdoor thermistor" on page 31.
Refer the deicer P.C. board.

※1.<The case of the trouble of the serial signal>
When the power is turned off and then turned on again, the indication shows “the trouble of mis-wiring”.

10-2-1. Troubleshooting check table



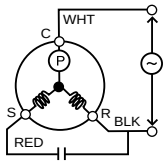
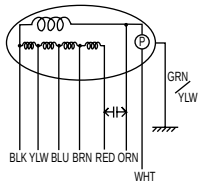
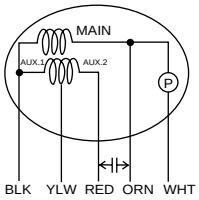
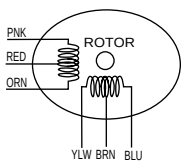
Before taking measures, make sure that the symptom reappears, for accurate troubleshooting.
Self check table

No.	Abnormal point	Operation indicator lamp	Symptom	Detection method	Checkpoint
1	Mis-Wiring	0.5-second ON 0.5-second OFF	Outdoor unit does not operate.	After 3 minutes from power supply turns ON, when serial signal is not received.	• Refer to Ⓖ "How to check mis-wiring and serial signal error" on page 30.
	Serial signal	1-time flash 2.5-second OFF		When serial signal from outdoor unit stops for 4 to 5 seconds.	• Refer to Ⓖ "How to check mis-wiring and serial signal error" on page 29.
2	Indoor coil thermistor Room temperature thermistor	2-time flash 2.5-second OFF	Outdoor unit does not operate.	Detect Indoor coil/room temperature thermistor short or open circuit every 8 seconds during operation.	• Refer to the characteristics of main indoor coil thermistor, sub indoor coil thermistor, and room temperature thermistor on page 32 or 33.
3	Outdoor thermistor	6-time flash 2.5-second OFF	Outdoor unit does not operate.	<Thermistor short> Thermistors are abnormal when they short after compressor start-up. <Thermistor open> Thermistors are abnormal when they open after compressor start-up.	• Refer to Ⓗ "Check of outdoor thermistor" on page 31.
4	Outdoor control P.C. board	7-time flash 2.5-second OFF	Outdoor unit does not run	When it cannot properly read data in the nonvolatile memory of the outdoor control P.C. board.	• Check the outdoor control P.C. board.

NOTE : When the indoor unit has started operation and the above detection method has detected an abnormality (the first detection after the power ON), the indoor electronic control P.C. board turns OFF the indoor fan motor with the OPERATION INDICATOR lamp flashing.

10-2-2. Trouble criterion of main parts

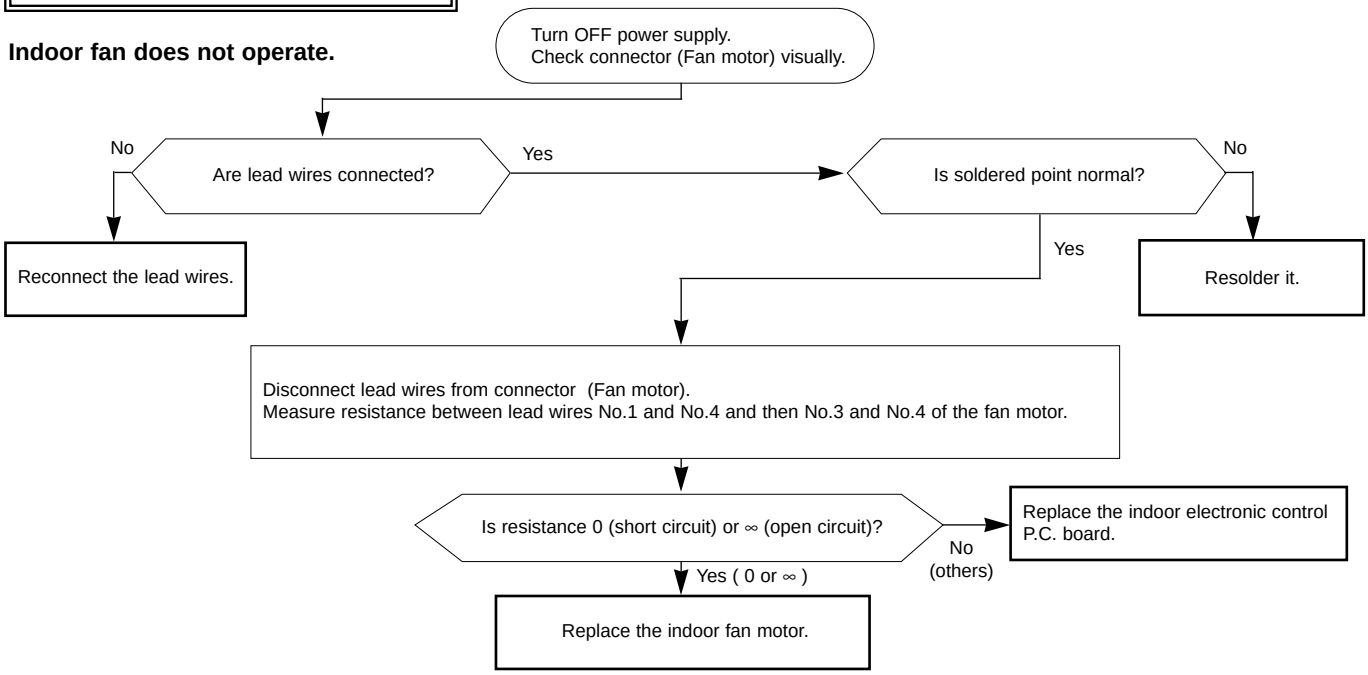
MCFH-24NV -EB MUCFH-24NV -EB

<table>
<tr><th>Part name</th><th>Check method and criterion</th><th>Figure</th></tr>
<tr><td>Room temperature thermistor (RT11)
Indoor coil thermistor (RT12)</td><td>Measure the resistance with a tester.
(Part temperature 10°C ~ 30°C)<table><tr><th>Normal</th><th>Abnormal</th></tr><tr><td>8kΩ ~ 20kΩ</td><td>Opened or short-circuited</td></tr></table></td><td></td></tr>
<tr><td>Defrost thermistor (RT61)</td><td>Measure the resistance with a tester.
(Part temperature - 10°C ~ 40°C)<table><tr><th>Normal</th><th>Abnormal</th></tr><tr><td>5kΩ ~ 60kΩ</td><td>Opened or short-circuited</td></tr></table></td><td></td></tr>
<tr><td>Ambient temper-ature thermistor (RT63)</td><td>Measure the resistance with a tester.
(Part temperature –10°C ~ 40°C)<table><tr><th>Normal</th><th>Abnormal</th></tr><tr><td>5kΩ ~ 60kΩ</td><td>Open or short-circuit</td></tr></table></td><td></td></tr>
<tr><td>Compressor (MC)</td><td>Measure the resistance between the terminals with a tester.
(Coil wiring temperature -10°C ~ 40°C)<table><tr><th></th><th>Normal</th><th>Abnormal</th></tr><tr><td>C-R</td><td>0.84~1.04Ω</td><td rowspan="2">Opened or short-circuited</td></tr><tr><td>C-S</td><td>1.82~2.24Ω</td></tr></table></td><td> 
</td></tr>
<tr><td>Indoor fan motor (MF)</td><td>Measure the resistance between the terminals with a tester.
(Coil wiring temperature10°C ~ 30°C)<table><tr><th></th><th>Normal</th><th>Abnormal</th></tr><tr><td>WHT-BLK</td><td>79~87Ω</td><td rowspan="5">Opened or short-circuited</td></tr><tr><td>BLK-YLW</td><td>63~69Ω</td></tr><tr><td>YLW-BLU</td><td>34~38Ω</td></tr><tr><td>BLU-BRN</td><td>25~29Ω</td></tr><tr><td>BRN-RED</td><td>13~15Ω</td></tr></table></td><td> 
</td></tr>
<tr><td>Outdoor fan motor (MF)</td><td>Measure the resistance between the terminals with a tester.
(Coil wiring temperature -10°C ~ 40°C)<table><tr><th></th><th>Normal</th><th>Abnormal</th></tr><tr><td>WHT-BLK</td><td>55~68Ω</td><td rowspan="3">Opened or short-circuited</td></tr><tr><td>BLK-YLW</td><td>26~33Ω</td></tr><tr><td>YLW-RED</td><td>55~68Ω</td></tr></table></td><td> 
</td></tr>
<tr><td>Vane motor (MV)</td><td>Measure the resistance between the terminals with a tester.
(Coil wiring temperature10°C ~ 30°C)<table><tr><th></th><th>Normal</th><th>Abnormal</th></tr><tr><td>RED-PNK/ORN
BRN-YLW/BLU</td><td>329~357Ω</td><td>Opened or short-circuited</td></tr></table></td><td> 
</td></tr>
</table>

ⓟ: Inner protector

Ⓐ Check of indoor fan motor

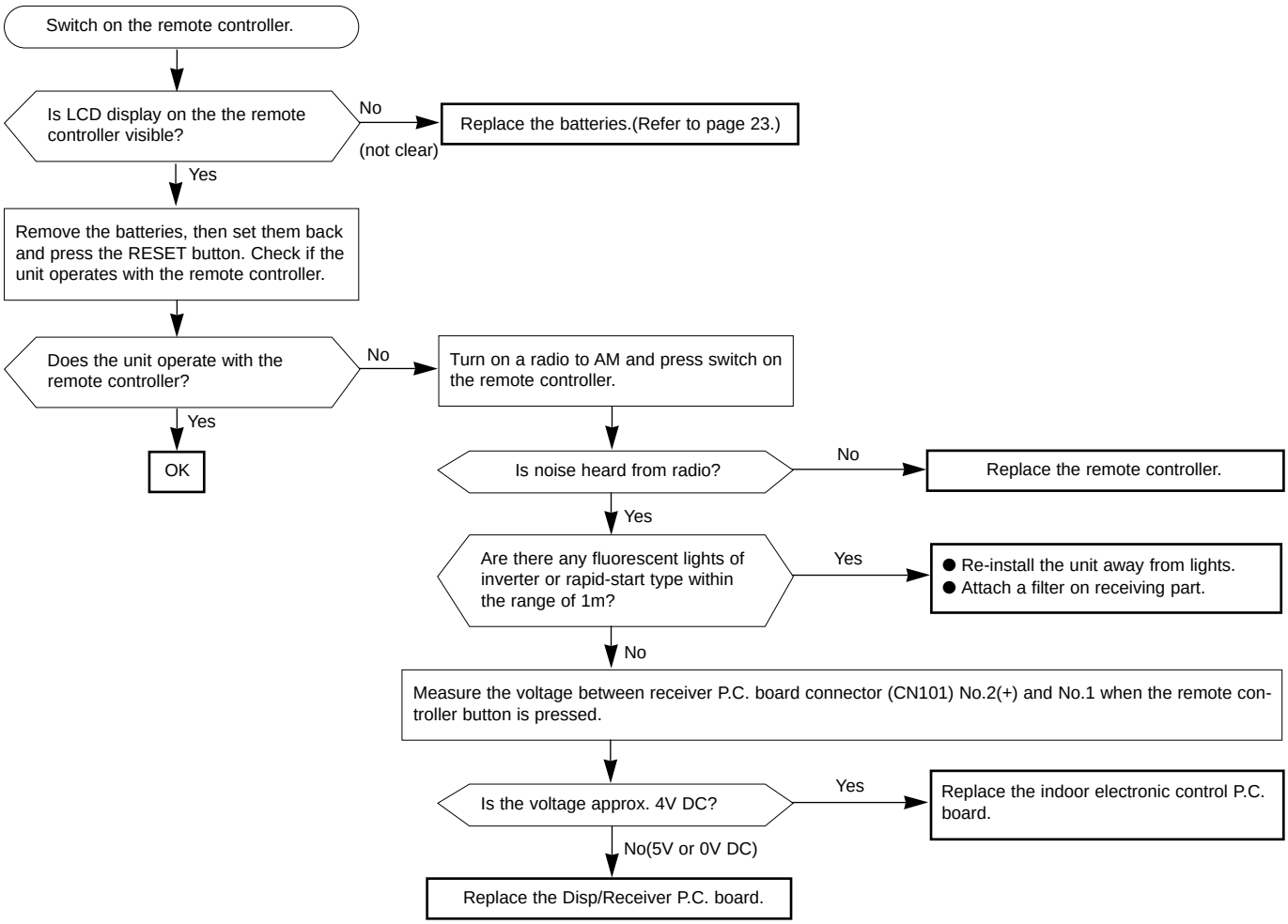
Indoor fan does not operate.


Turn OFF power supply.
Check connector (Fan motor) visually.
Are lead wires connected?
No
Yes
Is soldered point normal?
No
Yes
Reconnect the lead wires.
Resolder it.
Disconnect lead wires from connector (Fan motor).
Measure resistance between lead wires No.1 and No.4 and then No.3 and No.4 of the fan motor.
Is resistance 0 (short circuit) or ∞ (open circuit)?
No
(others)
Replace the indoor electronic control P.C. board.
Yes (0 or ∞)
Replace the indoor fan motor.

Ⓑ Check of remote controller and receiver P.C. board

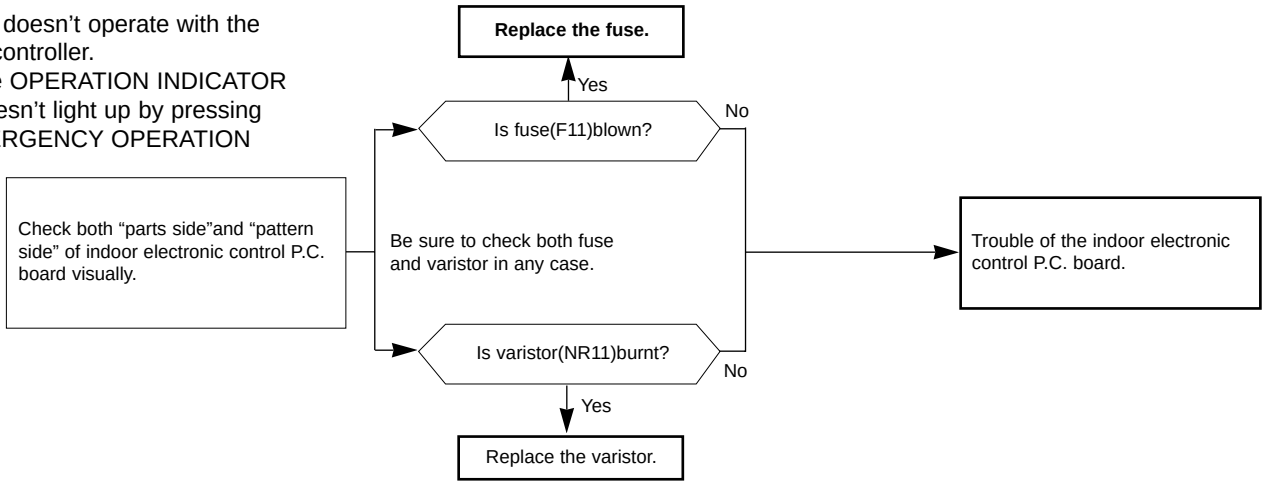
Indoor unit operates by pressing the EMERGENCY OPERATION switch, but doesn't operate with the remote controller.

※ Check if the remote controller is exclusive for this air conditioner.


Switch on the remote controller.
Is LCD display on the the remote controller visible?
No
(not clear)
Replace the batteries.(Refer to page 23.)
Yes
Remove the batteries, then set them back and press the RESET button. Check if the unit operates with the remote controller.
Does the unit operate with the remote controller?
No
Turn on a radio to AM and press switch on the remote controller.
Yes
OK
Is noise heard from radio?
No
Replace the remote controller.
Yes
Are there any fluorescent lights of inverter or rapid-start type within the range of 1m?
Yes
● Re-install the unit away from lights.
● Attach a filter on receiving part.
No
Measure the voltage between receiver P.C. board connector (CN101) No.2(+) and No.1 when the remote controller button is pressed.
Is the voltage approx. 4V DC?
Yes
Replace the indoor electronic control P.C. board.
No(5V or 0V DC)
Replace the Disp/Receiver P.C. board.

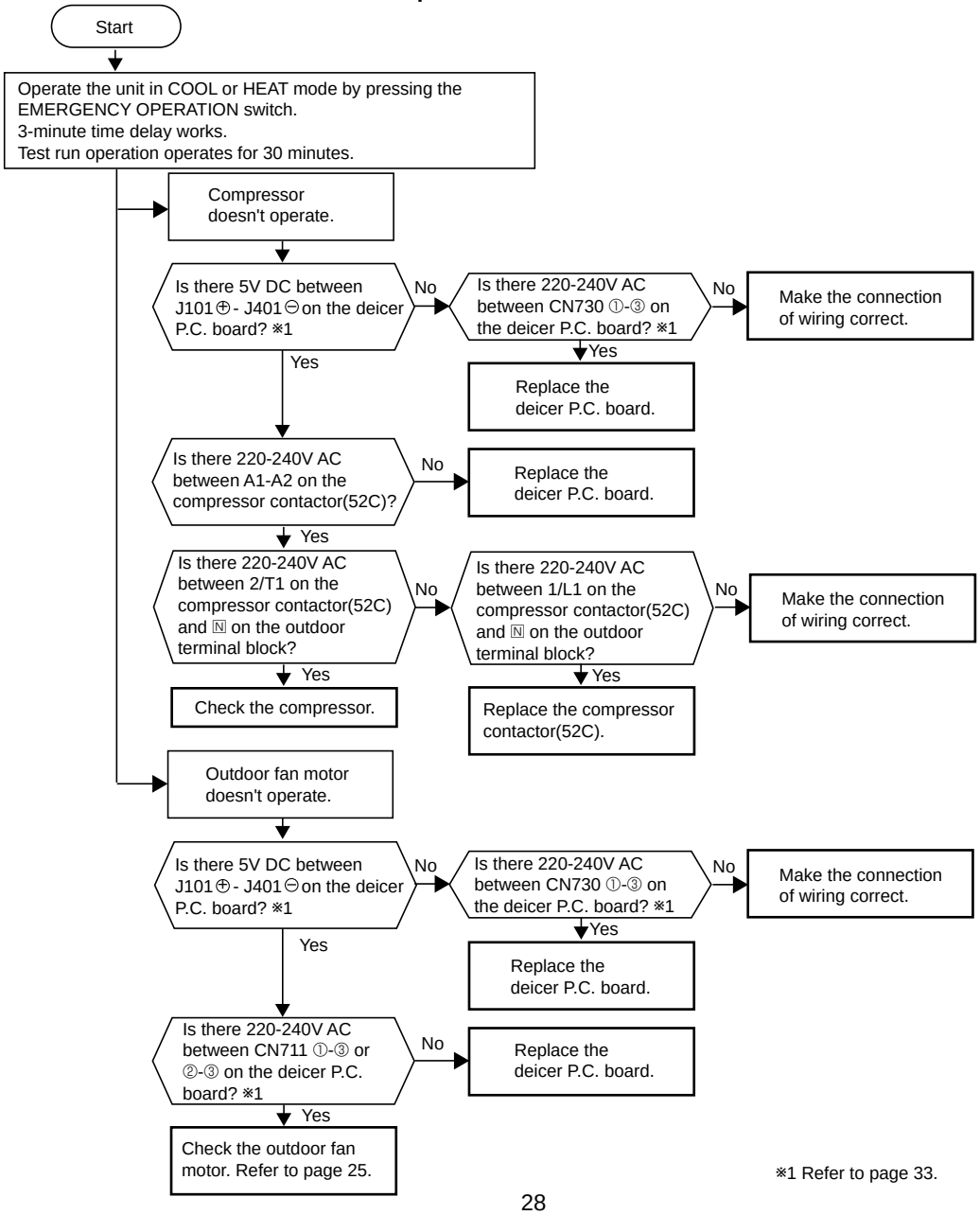
Ⓒ Check of indoor electronic control P.C. board

The unit doesn't operate with the remote controller.
Also, the OPERATION INDICATOR lamp doesn't light up by pressing the EMERGENCY OPERATION switch.


Replace the fuse.
Yes
Is fuse(F11)blown?
No
Check both "parts side"and "pattern side" of indoor electronic control P.C. board visually.
Be sure to check both fuse and varistor in any case.
Trouble of the indoor electronic control P.C. board.
Is varistor(NR11)burnt?
No
Yes
Replace the varistor.

Ⓓ Check of outdoor unit

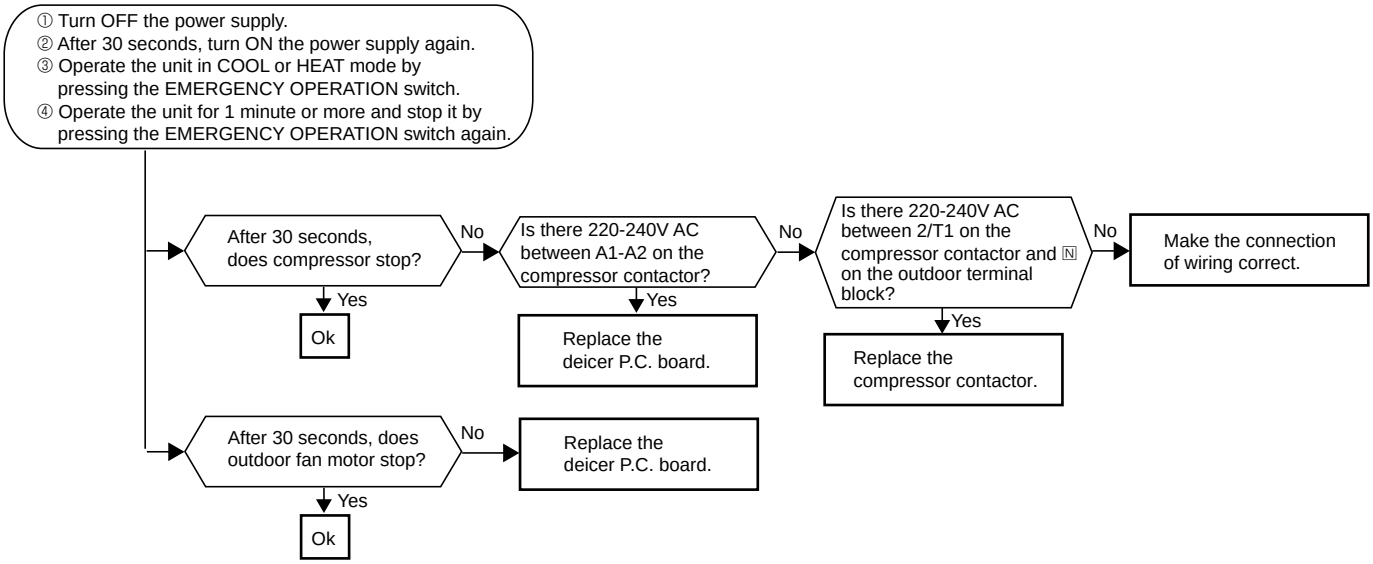
Compressor and or outdoor fan motor doesn't operate.


Start
Operate the unit in COOL or HEAT mode by pressing the EMERGENCY OPERATION switch.
3-minute time delay works.
Test run operation operates for 30 minutes.
Compressor doesn't operate.
Is there 5V DC between J101⊕ - J401⊖ on the deicer P.C. board? ※1
No
Is there 220-240V AC between CN730 ①-③ on the deicer P.C. board? ※1
No
Make the connection of wiring correct.
Yes
Replace the deicer P.C. board.
Yes
Is there 220-240V AC between A1-A2 on the compressor contactor(52C)?
No
Replace the deicer P.C. board.
Yes
Is there 220-240V AC between 2/T1 on the compressor contactor(52C) and N on the outdoor terminal block?
No
Is there 220-240V AC between 1/L1 on the compressor contactor(52C) and N on the outdoor terminal block?
No
Make the connection of wiring correct.
Yes
Check the compressor.
Yes
Replace the compressor contactor(52C).
Outdoor fan motor doesn't operate.
Is there 5V DC between J101⊕ - J401⊖ on the deicer P.C. board? ※1
No
Is there 220-240V AC between CN730 ①-③ on the deicer P.C. board? ※1
No
Make the connection of wiring correct.
Yes
Replace the deicer P.C. board.
Yes
Is there 220-240V AC between CN711 ①-③ or ②-③ on the deicer P.C. board? ※1
No
Replace the deicer P.C. board.
Yes
Check the outdoor fan motor. Refer to page 25.

※1 Refer to page 33.

Ⓔ Check of outdoor unit

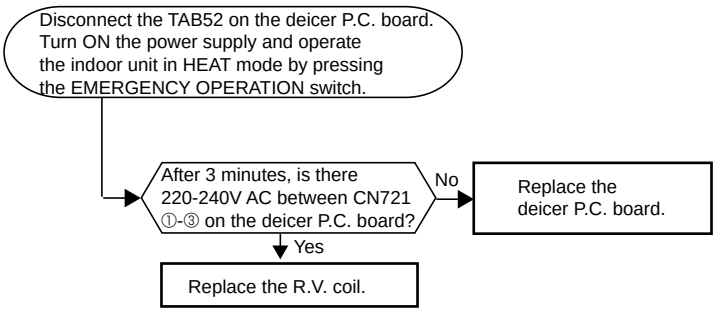
Compressor and / or outdoor fan motor doesn't stop.


① Turn OFF the power supply.
② After 30 seconds, turn ON the power supply again.
③ Operate the unit in COOL or HEAT mode by pressing the EMERGENCY OPERATION switch.
④ Operate the unit for 1 minute or more and stop it by pressing the EMERGENCY OPERATION switch again.
After 30 seconds, does compressor stop?
No
Is there 220-240V AC between A1-A2 on the compressor contactor?
No
Is there 220-240V AC between 2/T1 on the compressor contactor and N on the outdoor terminal block?
No
Make the connection of wiring correct.
Yes
Ok
Yes
Replace the deicer P.C. board.
Yes
Replace the compressor contactor.
After 30 seconds, does outdoor fan motor stop?
No
Replace the deicer P.C. board.
Yes
Ok

Ⓕ Check of R.V. coil

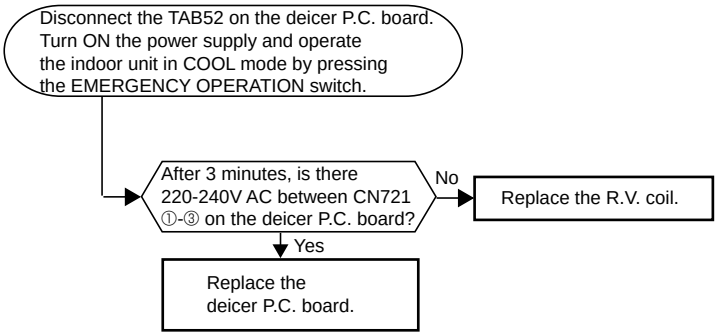
Unit operates COOL mode even if it is set to HEAT mode.

※ First, measure the resistance of R.V. coil to confirm it is disconnected or is not short-circuit.


Disconnect the TAB52 on the deicer P.C. board.
Turn ON the power supply and operate the indoor unit in HEAT mode by pressing the EMERGENCY OPERATION switch.
After 3 minutes, is there 220-240V AC between CN721 ①-③ on the deicer P.C. board?
No
Replace the deicer P.C. board.
Yes
Replace the R.V. coil.

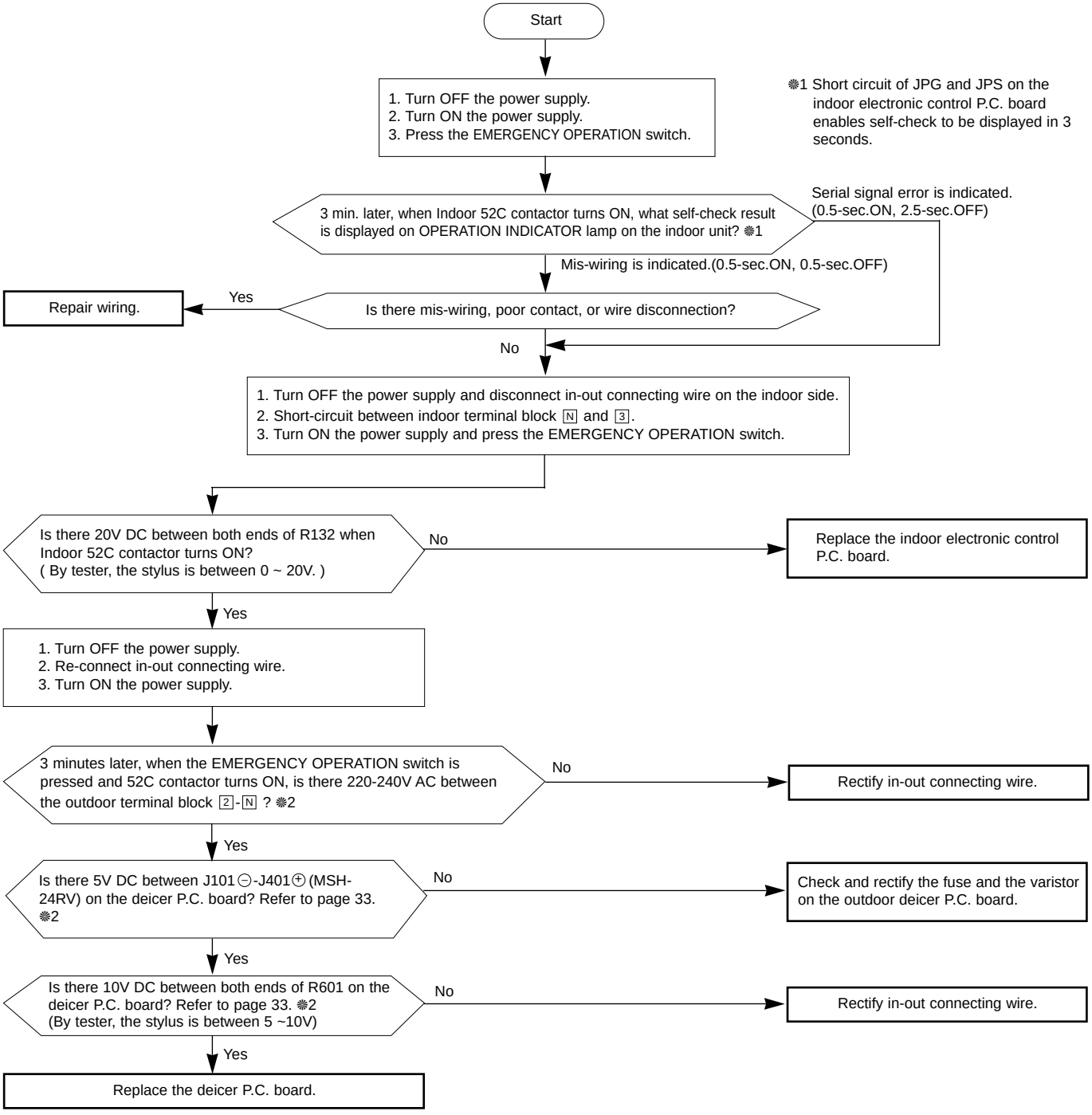
Unit operates HEAT mode even if it is set to COOL mode.

※ First, measure the resistance of R.V. coil to confirm it is disconnected or is not short-circuit.


Disconnect the TAB52 on the deicer P.C. board.
Turn ON the power supply and operate the indoor unit in COOL mode by pressing the EMERGENCY OPERATION switch.
After 3 minutes, is there 220-240V AC between CN721 ①-③ on the deicer P.C. board?
No
Replace the R.V. coil.
Yes
Replace the deicer P.C. board.

Ⓖ How to check mis-wiring and serial signal error (when outdoor unit doesn't work)

Outdoor unit doesn't operate.

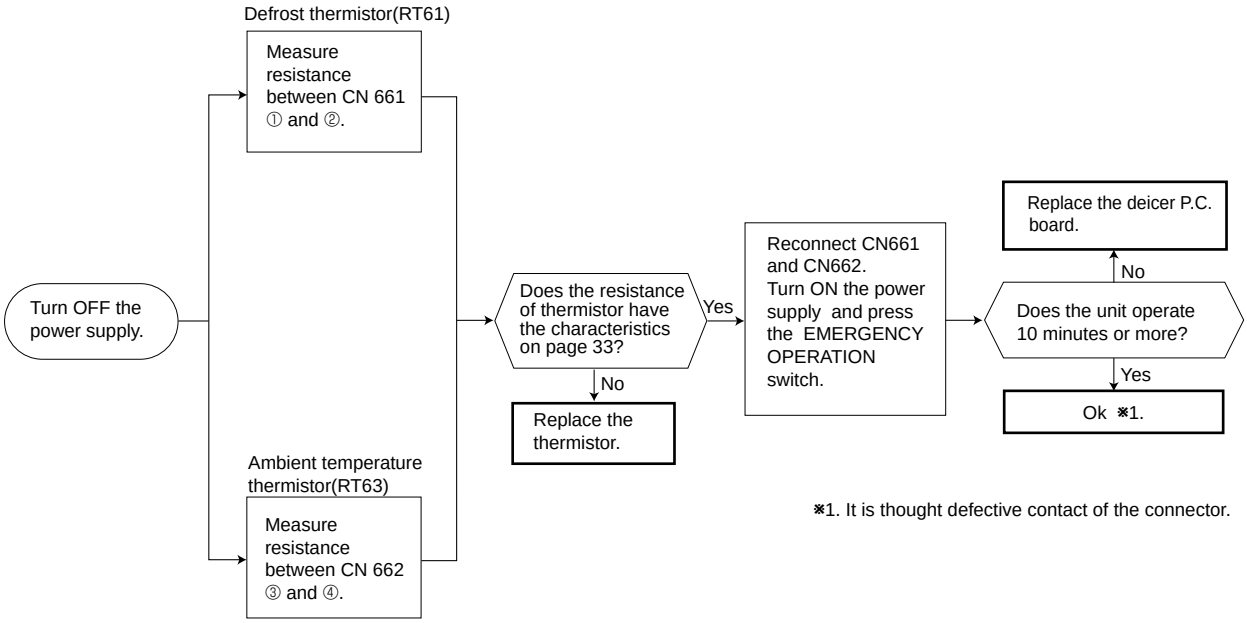

Start
1. Turn OFF the power supply.
2. Turn ON the power supply.
3. Press the EMERGENCY OPERATION switch.
※1 Short circuit of JPG and JPS on the indoor electronic control P.C. board enables self-check to be displayed in 3 seconds.
3 min. later, when Indoor 52C contactor turns ON, what self-check result is displayed on OPERATION INDICATOR lamp on the indoor unit? ※1
Serial signal error is indicated. (0.5-sec.ON, 2.5-sec.OFF)
Mis-wiring is indicated.(0.5-sec.ON, 0.5-sec.OFF)
Is there mis-wiring, poor contact, or wire disconnection?
Yes
Repair wiring.
No
1. Turn OFF the power supply and disconnect in-out connecting wire on the indoor side.
2. Short-circuit between indoor terminal block N and 3.
3. Turn ON the power supply and press the EMERGENCY OPERATION switch.
Is there 20V DC between both ends of R132 when Indoor 52C contactor turns ON?
(By tester, the stylus is between 0 ~ 20V.)
No
Replace the indoor electronic control P.C. board.
Yes
1. Turn OFF the power supply.
2. Re-connect in-out connecting wire.
3. Turn ON the power supply.
3 minutes later, when the EMERGENCY OPERATION switch is pressed and 52C contactor turns ON, is there 220-240V AC between the outdoor terminal block 2-N ? ※2
No
Rectify in-out connecting wire.
Yes
Is there 5V DC between J101⊖-J401⊕ (MSH-24RV) on the deicer P.C. board? Refer to page 33. ※2
No
Check and rectify the fuse and the varistor on the outdoor deicer P.C. board.
Yes
Is there 10V DC between both ends of R601 on the deicer P.C. board? Refer to page 33. ※2
(By tester, the stylus is between 5 ~10V)
No
Rectify in-out connecting wire.
Yes
Replace the deicer P.C. board.

※2 While the serial signal error is indicated, Indoor 52C contactor alternates ON for about 10 seconds and OFF for 3 minutes. Measure the voltage when 52C contactor is ON.

Ⓗ Check of outdoor thermistor

Thermistors in the outdoor unit are abnormal.

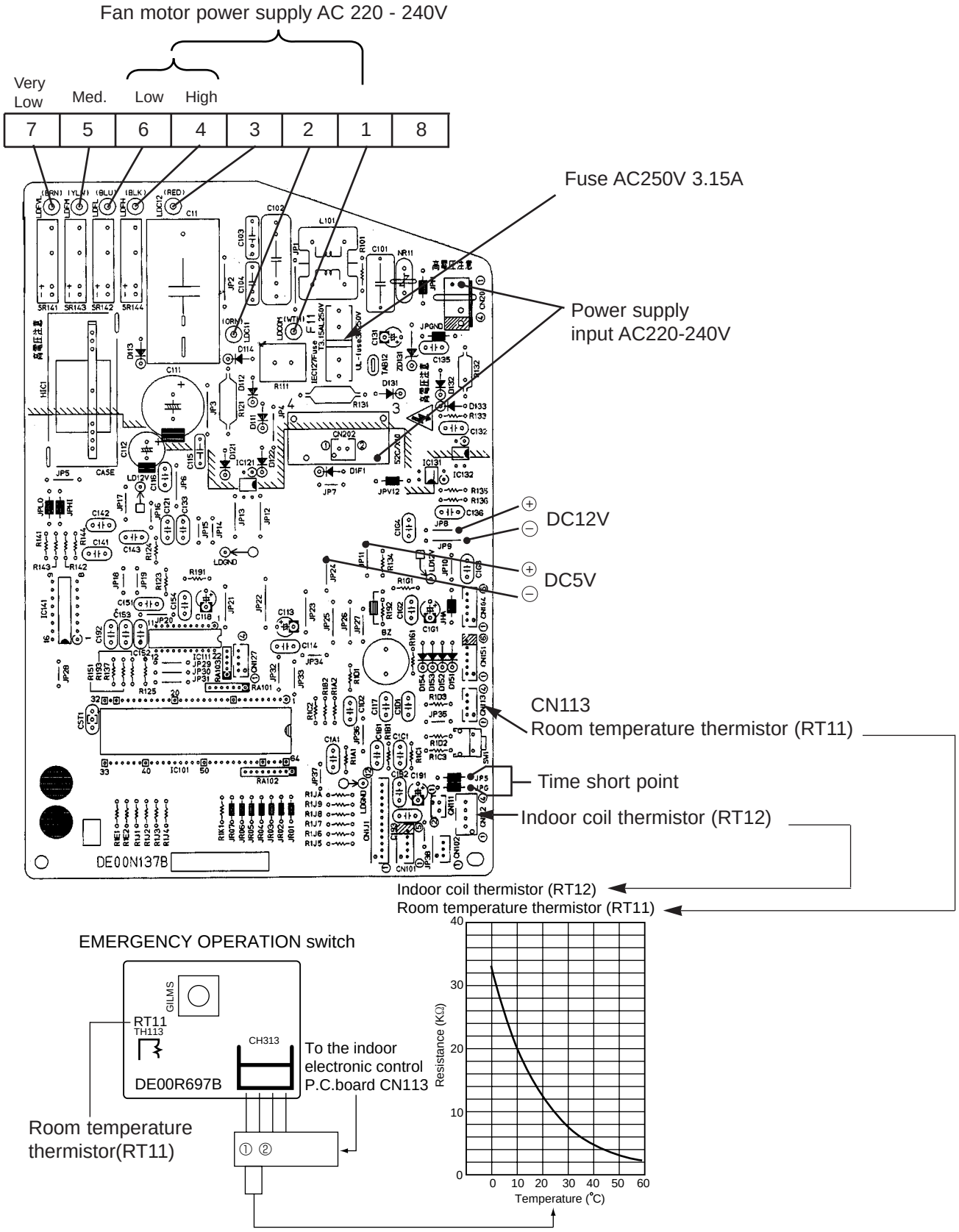
※ Disconnect the connectors CN661 and/or CN662 from the deicer P.C. board.
(Check the characteristics of each thermistor.)


Defrost thermistor(RT61)
Measure resistance between CN 661 ① and ②.
Turn OFF the power supply.
Does the resistance of thermistor have the characteristics on page 33?
Yes
No
Replace the thermistor.
Reconnect CN661 and CN662. Turn ON the power supply and press the EMERGENCY OPERATION switch.
Does the unit operate 10 minutes or more?
No
Replace the deicer P.C. board.
Yes
Ok ※1.
Ambient temperature thermistor(RT63)
Measure resistance between CN 662 ③ and ④.

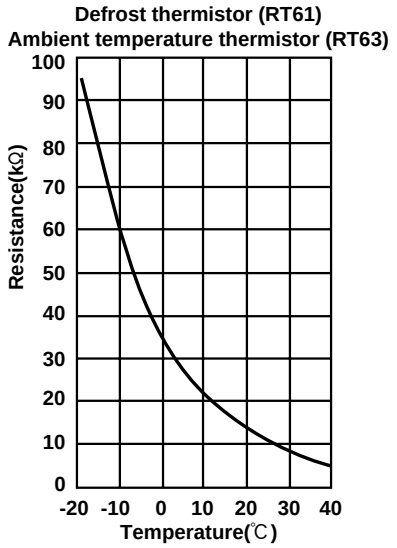
※1. It is thought defective contact of the connector.

TEST POINT DIAGRAM AND VOLTAGE
MCFH-24NV - EB

Indoor electronic control P.C. board



MUCFH-24NV -EB
Outdoor deicer P.C. board



CN661 ①-②
Defrost thermistor (RT61)
(Refer to page 31.)

CN662 ③-④
Ambient temperature thermistor (RT63)
(Refer to page 31.)

Fan motor connector (CN711)

Varistor (NR62)

R.V. coil (CN721)

12V DC

Defrost interval time short pin(JPG1, R871)
(Refer to page 22.)

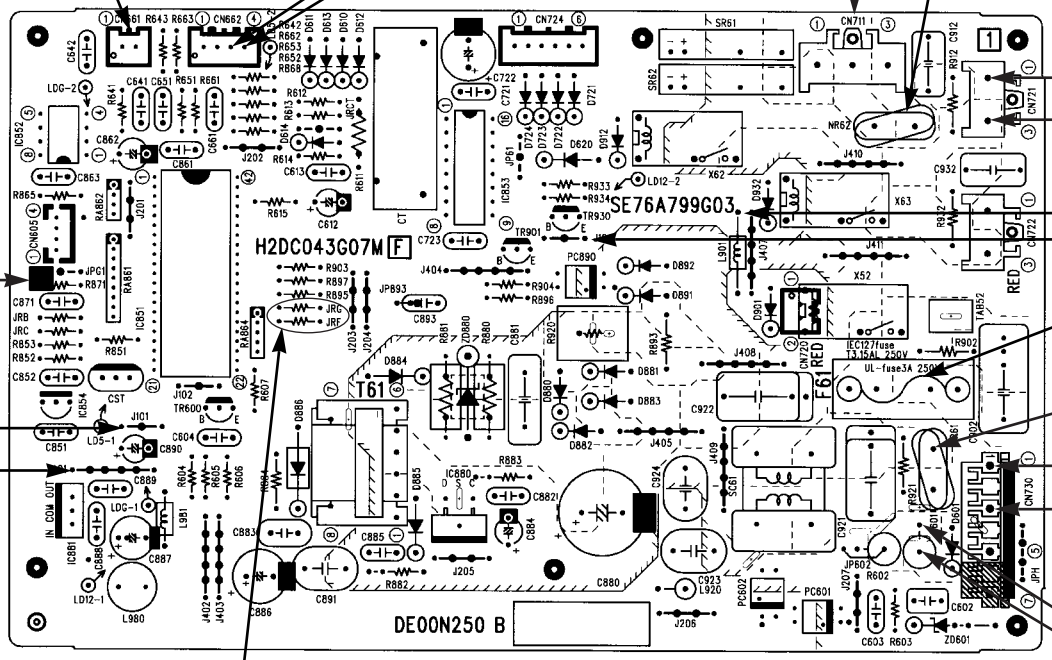
Fuse 3.15A / 250V

Varistor (NR61)

J101 ⊕
5V DC
J401 ⊖
(Refer to page 28, 30.)

CN730①-③
220-240V AC
(Refer to page 28.)

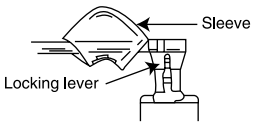
R601
10V DC
(Refer to page 30.)



Jumper wire for change in defrost setting (JRF, JRG)
(Refer to page 22.)

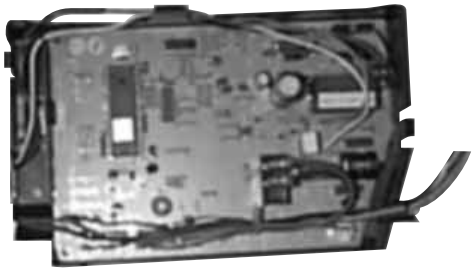
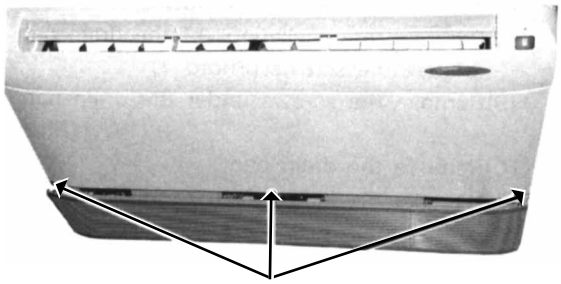
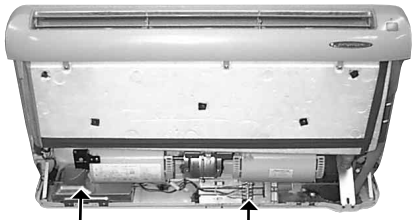
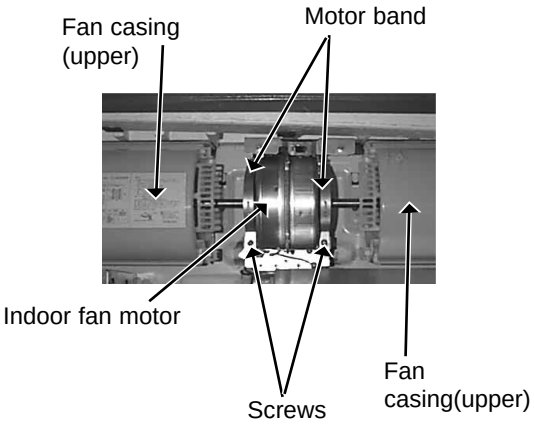
11 DISASSEMBLY INSTRUCTIONS

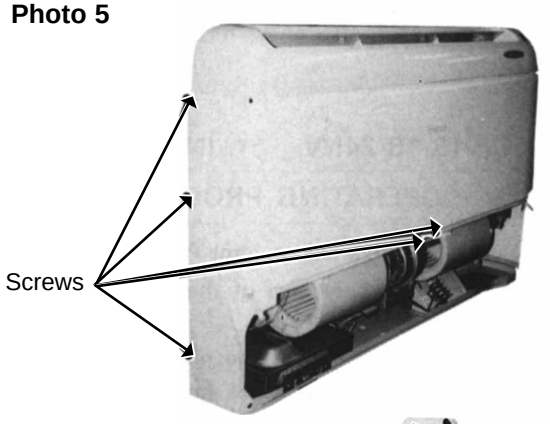
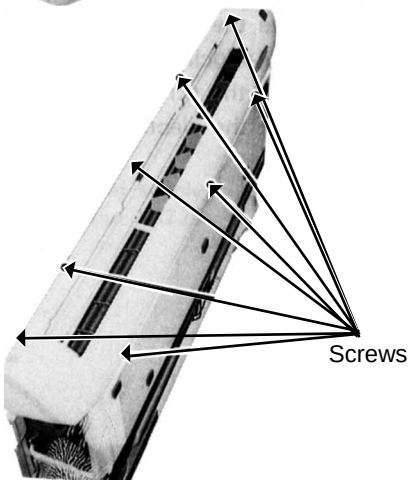
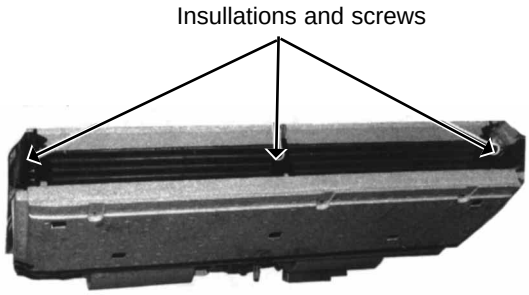
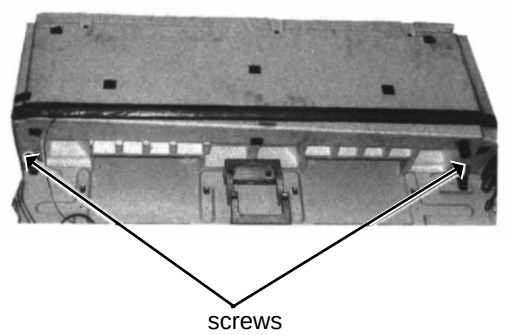
"※" shows the terminals with a lock mechanism, so they cannot be removed when you pull the lead wire.
Be sure to pull the wire by pushing the locking lever (project part) of the terminal with a finger.



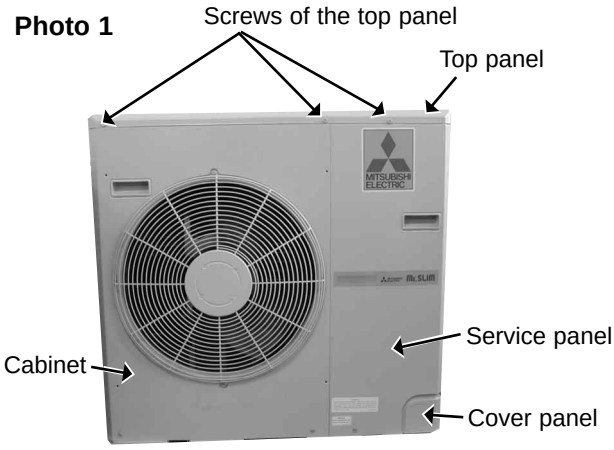
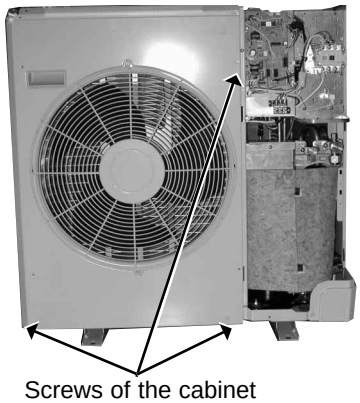
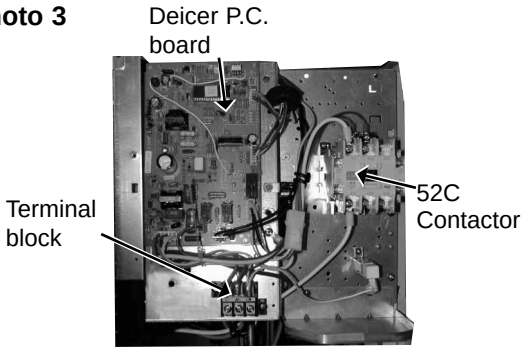
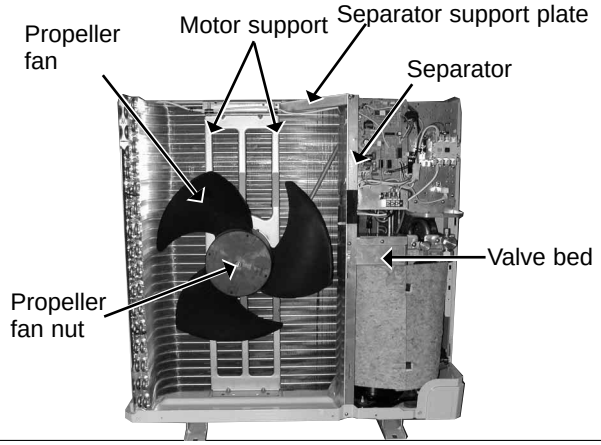
①Slide the sleeve.
②Pull the wire while pushing the locking lever.

11-1.MCFH-24NV-EB
INDOOR UNIT

OPERATING PROCEDURE	PHOTOS
1. Removing the electronic control P. C . board. (1) Pull out the upper part of the grill. (photo 1) (2) Remove the screws of the grill. (3) Remove screws of terminal block cover. Remove the terminal block cover and remove the terminal block. (4) Remove the screws of the electronic box cover. (5) Pull out the electronic control P. C. board. **Photo 3** 	**Photo 1**  Screws **Photo 2**  Electronic box Terminal block
2. Removing the indoor fan motor (1) Remove the grill. (Refer to 1(1) (2)) (2) Remove the screws of the pipe support assembly. (3) Remove the fan casings.(upper) . (4) Disconnect the connector of the indoor fan motor. (5) Disconnect the ground wire of the fan motor. (6) Remove the screws of the motor band and remove the catch. (7) Take out the sirocco fan and the indoor fan motor .	**Photo 4**  Fan casing (upper) Motor band Indoor fan motor Screws Fan casing(upper)

OPERATING PROCEDURE	PHOTOS
3. Removing the indoor heat exchanger. (1) Remove the grill. (Refer to 1(1) (2)) (2) Remove the screws on both side and in front of the front panel. (Photo 5) (3) Remove the screws of the nozzle assembly. (Photo 6) (4) Remove the electronic box . (Refer to 1) (5) Remove the indoor fan motor . (Refer to 2) (6) Remove the screws of the motor support . (7) Remove the fan casing . (lower) (8) Remove the insullations of the drain pan and remove the screws . (Photo 7) (9) Remove the screws under the drain pan .(Photo 8) (10) Remove the drain pan . (11) Remove the indoor heat exchanger.	**Photo 5**  **Photo 6**  **Photo 7**  **Photo 8** 

11-2. MUCFH-24NV -EB
OUTDOOR UNIT

OPERATING PROCEDURE	PHOTOS
1. Removing the cabinet (1) Remove the screws of the top panel and the top panel. (2) Remove the screw of the service panel. To remove the service panel, pull it down toward you and unhook the catches on the both sides. (3) Remove the screw of the cover panel. To remove the cover panel. (4) Remove the screws of the cabinet. Open the cabinet to a 45-degree angle. Then lift it and unhook the catches to remove.	**Photo 1**  **Photo 2** 
2. Removing the deicer P.C. board (1) Remove the top panel, the service panel and the cover panel. (2) Disconnect all the connectors and the terminals on the deicer P.C. board. (3) Remove the deicer P.C. board.	**Photo 3** 
3. Removing the propeller fan and the outdoor fan motor (1) Remove the cabinet. (Refer to 1) (2) Remove the propeller fan nut and the propeller fan. **NOTE**:Loose the propeller fan in the rotating direction for removal. When attaching the propeller fan, align the mark on the propeller fan and the motor shaft cut section. Set the propeller fan in position by using the cut on the shaft and the mark on the propeller fan. (3) Remove the screws and the outdoor fan motor and the connectors. Remove the outdoor fan motor.	**Photo 4** 

OPERATING PROCEDURE

4. Removing the heat exchanger and compressor

(1) Remove the screws of the rear panel. Remove the screws of the valve bed and the valve bed. (The valve bed is fixed by the catches on the right and left sides. Lift it to remove.)
Open the rear panel to the rear to remove.

NOTE :
All panels are fixed by catches, and must be removed by up and down.

(2) Remove the screws of the side panel and the side panel.
(3) Remove the screws of the rear guard and the rear guard.
(4) Remove the screws of the separator support plate and the separator support plate.
(5) Remove the screws of the motor support and the motor support.
(6) Remove the relay panel.
Disconnect the fan motor lead wires.
(7) Remove the soundproof felt.
(8) Remove the screws of the separator and the separator.
(9) Recover gas from the refrigerant circuit.
(10) Remove the screws of the heat exchanger and the heat exchanger.
Detach the welded part of pipe.
(11) Remove the nuts of the compressor and the compressor.
Detach the welded part of the suction pipe and the discharge pipe.

NOTE

- Before using a burner, purge gas from the pipes until the pressure gauge shows 0 MPa.
- Use the burner under the condition that gas can be released even when the inner pressure rises by heat.

PHOTOS

Photo 5

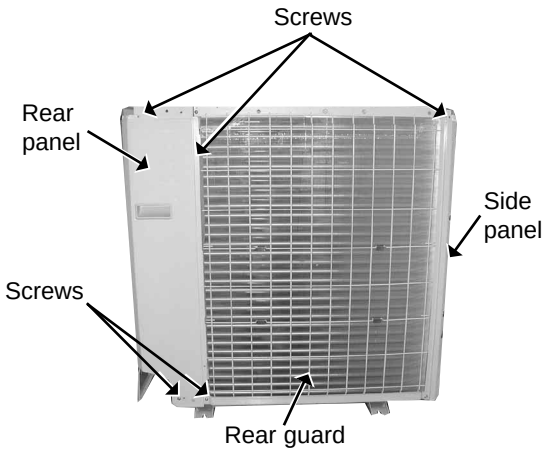


Photo 6

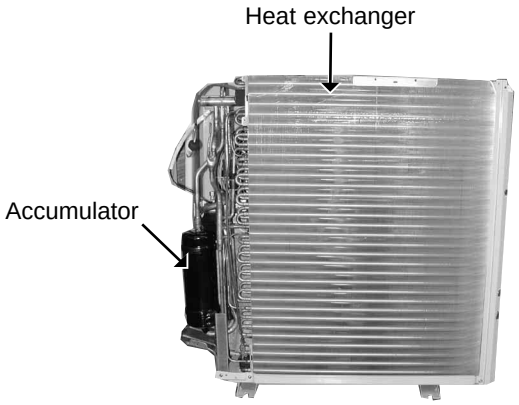
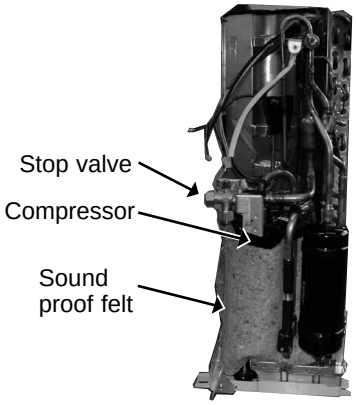


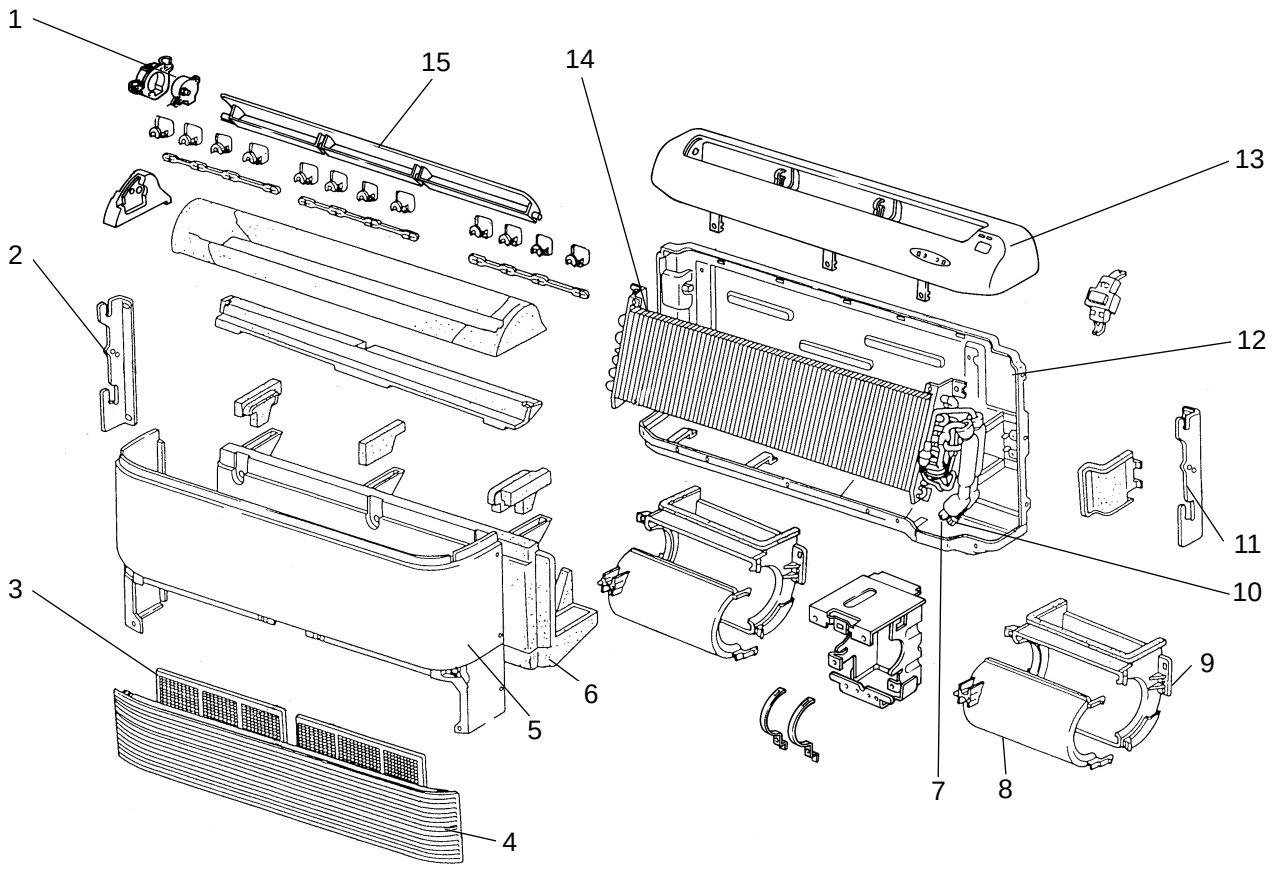
Photo 7



12 PARTS LIST

MCFH-24NV - EB

12-1. INDOOR UNIT
STRUCTURAL PARTS

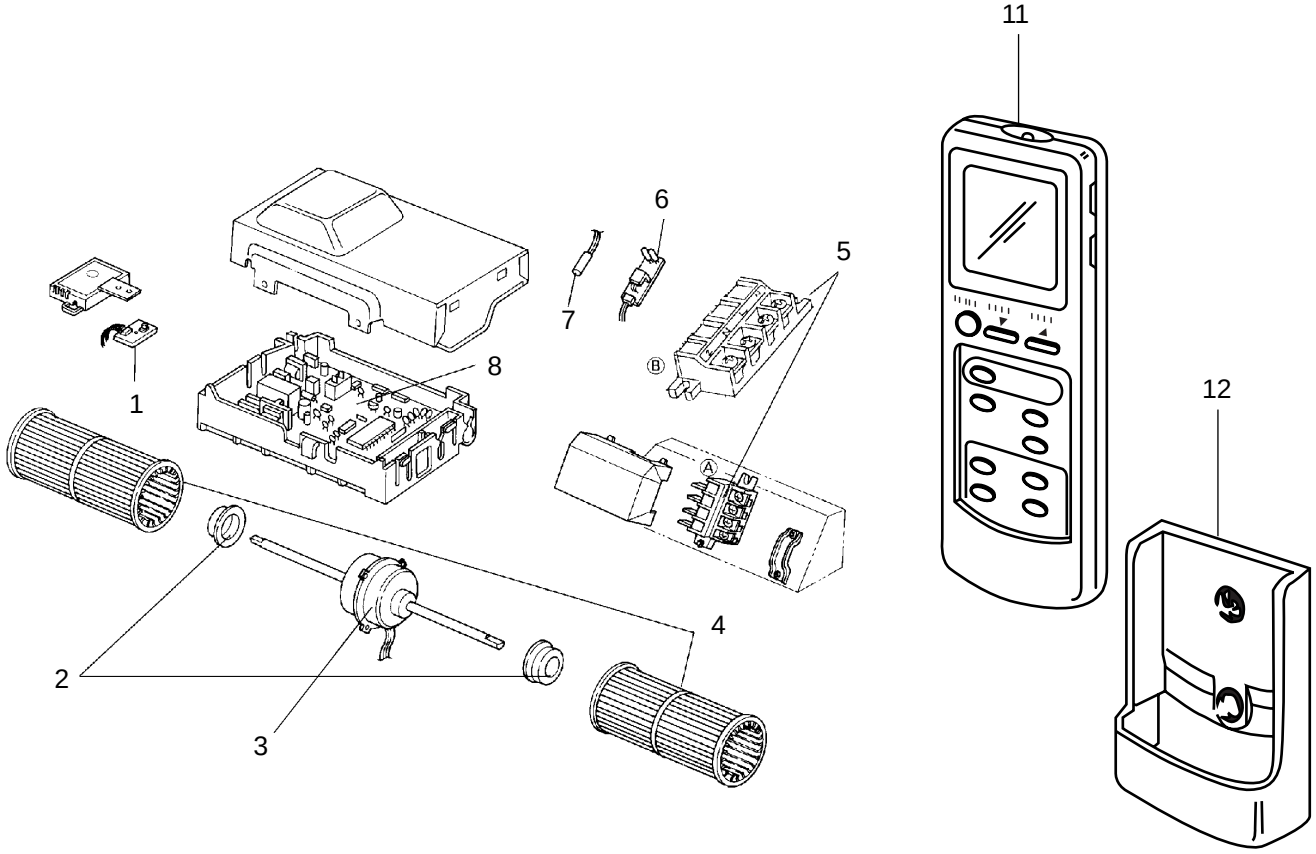


Part number that are circled is not shown in the illustration.

No.	Part No.	Part name	Symbol in Wiring Diagram	Q'ty/unit MCFH-24NV- EB WH	Remark
1	E02 227 303	VANE MOTOR	MV	1	
2	E02 179 971	INSTALLATION METAL (L)		1	
3	E02 179 100	AIR FILTER		2	
4	E02 179 010	GRILLE		1	
5	E02 179 000	FRONT PANEL		1	
6	E02 215 700	DRAIN PAN		1	
7	E02 138 666	UNION(GAS)		1	ϕ15.88
8	E02 179 237	FAN CASING(UPPER)		2	
9	E02 179 238	FAN CASING(LOWER)		2	
10	E02 176 667	UNION(LIQUID)		1	ϕ9.52
11	E02 179 972	INSTALLATION METAL (R)		1	
12	E02 179 231	BACK PANEL		1	
13	E02 227 235	NOZZLE		1	
14	E02 179 620	INDOOR HERT EXCHANGER		1	
15	E02 227 040	VANE		1	
⑯	E02 179 142	GRILLE CATCH		3	3PCS/SET

MCFH-24NV -EB (WH)
12-2. INDOOR UNIT ELECTRICAL PARTS

MCFH-24NV-EB (WH)
12-3. ACCESSORY AND REMOTE CONTROLLER PARTS



12-2. INDOOR UNIT ELECTRICAL PARTS

Part numbers that are circled is not shown in the illustration.

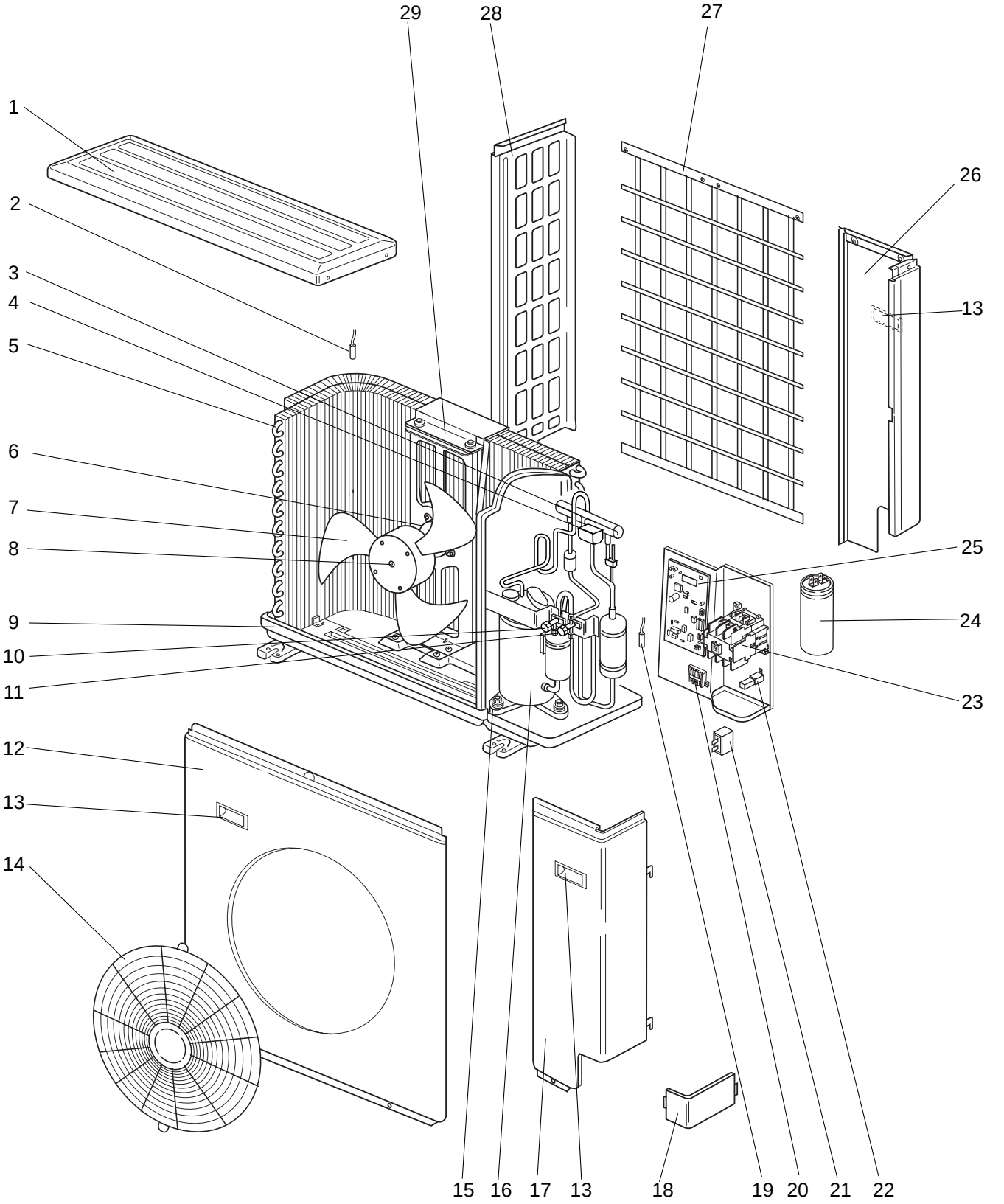
No.	Part No.	Part name	Symbol in Wiring Diagram	Q'ty/unit MCFH-24NV- EB WH	Remark
1	E02 215 328	SWITCH BOARD		1	
2	E02 179 505	FAN MOTOR RUBBER MOUNT		2	2PCS/SET
3	E02 229 300	INDOOR FAN MOTOR	MF	1	RB4V36-□□
4	E02 179 500	SIROCCO FAN		2	
5	E02 573 375	TERMINAL BLOCK	TB	1	FigureA
	E02 257 375	TERMINAL BLOCK	TB	1	FigureB
6	E02 227 468	RECEIVER P.C. BOARD		1	
7	E02 254 307	INDOOR COIL THERMISTOR	RT12	1	
8	E02 256 450	ELECTRONIC CONTROL P.C. BOARD		1	
⑨	E02 127 382	FUSE	F11	1	3.15A
⑩	E02 336 385	VARISTOR	NR11	1	

12-3. ACCESSORY AND REMOTE CONTROLLER PARTS

11	E02 257 426	REMOTE CONTROLLER		1	
12	E02 141 083	REMOTE CONTROLLER HOLDER		1	

MUCFH-24NV -EB

12-4. OUTDOOR UNIT STRUCTURAL PARTS, ELECTRICAL PARTS AND FUNCTIONAL PARTS



MUCFH-24NV -EB

12-4. OUTDOOR UNIT STRUCTURAL PARTS, ELECTRICAL PARTS AND FUNCTIONAL PARTS

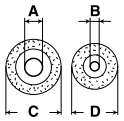
Part numbers that are circled are not shown in the illustration.

NO.	Part No.	Part Name	Symbol in Wiring Diagram	Q'ty/unit	Remarks
				MUCFH-24NV-EB	
1	E02 214 297	TOP PANEL		1	
2	E02 540 309	AMBIENT TEMPERATURE THERMISTOR	RT63	1	
3	E02 444 961	4-WAY VALVE		1	
4	E02 529 490	R.V. COIL	21S4	1	
5	E02 214 630	OUTDOOR HEAT EXCHANGER		1	
6	E02 214 301	OUTDOOR FAN MOTOR	MF	1	RA6V85-□□
7	E02 214 501	PROPELLER FAN		1	
8	E07 070 508	PROPELLER FAN NUT		1	
9	E02 214 290	BASE		1	
10	E02 527 662	STOP VALVE(LIQUID)		1	ϕ9.52
11	E02 527 661	STOP VALVE(GAS)		1	ϕ15.88
12	E02 214 232	CABINET		1	
13	E07 001 009	HANDLE		3	
14	E02 527 521	FAN GUARD		1	
15	E02 138 506	COMPRESSOR RUBBER SET		4	4RUBBERS/SET
16	E02 042 900	COMPRESSOR	MC	1	NH-47VMDT
17	E02 214 245	SERVICE PANEL		1	
18	E07 001 006	COVER PANEL		1	
19	E02 529 310	DEFROST THERMISTOR	RT61	1	
20	E02 198 374	TERMINAL BLOCK	TB	1	4P
21	E02 138 351	OUTDOOR FAN CAPACITOR	C2	1	3.0μF/440VAC
22	E02 128 383	SURGE ABSORBER 1	DSAR	1	
23	E02 010 342	COMPRESSOR CONTACTOR	52C	1	S-N25 250VAC
24	E02 082 353	COMPRESSOR CAPACITOR	C1	1	50μF/440VAC
25	E02 540 451	DEICER P.C. BOARD		1	
26	E02 214 522	REAR PANEL		1	
27	E02 605 523	REAR GUARD		1	
28	E02 214 249	SIDE PANEL		1	
29	E02 527 515	MOTOR SUPPORT		1	
	E02 262 936	CAPILLARY TUBE		1	ϕ4.0Xϕ2.4X200
(30)	E02 256 936	CAPILLARY TUBE		1	ϕ3.0Xϕ2.0X350
	E02 176 936	CAPILLARY TUBE		1	ϕ3.0Xϕ1.6X350
(31)	E02 127 382	FUSE	F61	1	3.15A
(32)	E07 336 385	VARISTOR	NR61	1	
(33)	E02 096 642	CHECK VALVE		1	
	E02 214 642	CHECK VALVE		1	
(34)	E02 214 644	DISCHAGE PRESSUR REGULATOR		1	
(35)	E02 214 384	SURGE ABSORBER	CZ	1	

13 OPTIONAL PARTS

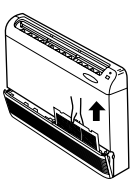
13-1. REFRIGERANT PIPES

The air conditioner has flared connections its indoor and outdoor sides.
Please use the optional extension pipe as follows.

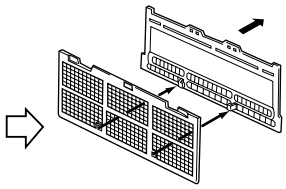
Applied unit	Models	Pipe length	Pipe size O.D.mm					Additional refrigerant charge R22(g)
			Cross-section	A-Gas	B-liquid	Insulation C	Insulation D	
MCFH-24NV -EB	MAC-860PI	3m		ϕ15.88	ϕ9.52	ϕ31	ϕ27	0
	MAC-861PI	5m						
	MAC-862PI	7m						
	MAC-863PI	10m						195
	MAC-864PI	15m						520

13-2. AIR CLEANING FILTER

- If the air cleaning filter is clogged, it may lower the unit's capacity or cause condensation at the air outlet .
- The air cleaning filter is disposable . The standard usable term is about 4 months . However , if the color of the filter turns to dark brown , replace soon .



Remove the air filter and the air cleaning filter together.

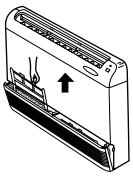


Separate the air cleaning filter (white bellows type) from the air filter.

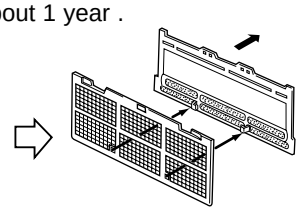
Applied unit	Models
MCFH-24NV-EB	MAC - 1200 FT

13-3. DEODORIZING FILTER

- Clean the filter every two weeks . When it becomes too dirt , clean it more often .
- Replace the filter with a new one when its color can not be restored even after washing or when the filter becomes dark.
- Standard interval for the filter replacement is about 1 year .



Remove the air filter and the deodorizing filter together.



Separate the deodorizing filter (gray sponge type) from the air filter.

Applied unit	Models
MCFH-24NV-EB	MAC - 1700 DF

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